AUTOMOTIVE INDUSTRIES

A CHILTON PUBLICATION

ENGINEERING • MANAGEMENT • PRODUCTION • DESIGN

OCTOBER 1, 1960

. . . Preview of 1961 Cars

NEW

Buick . . . Cadillac
Chevrolet . . . Dodge
Mercury . . . Falcon
Valiant . . . Pontiac
Ford . . . Continental
Chrysler . . . Corvair
Imperial . . . DeSoto
Corvette . . . Lark
Lancer . . . Plymouth
Oldsmobile . . . Dart

Chevrolet Trucks



Light Aluminum Block Demonstrated

Extreme light weight of Buick Special aluminum V-8 engine is demonstrated by 105-lb model balancing cylinder block and heads on a seesaw. Whole engine weighs only 318 lbs, for which output of 155 hp makes it one of lightest power plants on market. It is first aluminum V-8 engine built by American automobile industry.

PAGE 34



At Amana Refrigeration, Inc.

STANOIL

IMPROVES PRODUCTION
REDUCES MAINTENANCE

Smooths operation of 600 ton hydraulic press

Situation: The 600 ton Verson Press at Amana is a vital operating component in the manufacture of home freezers and refrigerators. Its proper performance is necessary to the efficiency of Amana's entire manufacturing operation. That's why erratic press operation, caused by foaming of the hydraulic oil, was a serious problem.

What was done? In seeking the solution to this problem, Amana consulted their Standard Oil lubrication specialist who recommended STANOIL for this service. STANOIL Industrial Oil is a top quality, first-line industrial lubricating and hydraulic oil. It will provide excellent service in many different applications. And when tested by Amana, STANOIL proved perfect for use.

What has happened? Since STANOIL was first put to work at Amana, it has performed for extended periods of time without foaming or oxidation, lengthening the time between drainings and improving press operation. As a result of this record, STANOIL has been adopted for use on other production equipment, together with Standard's RYKON Greases and SUPERLA Soluble Oil.

What you can do: To get help in solving your lubrication problems and to learn more about STANOIL Industrial Oils, simply call the Standard Oil office near you in any of the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.**

You expect more from STANDARD and you get it!

Standard's Jess Nelson (center) and Gene Maske (left) checking lubrication survey with Leonard Rettig, Amana's plant maintenance superintendent. Jess, who is District Engineer for Standard, is a specialist in this kind of operation. He has an engineering degree from the University of Iowa, and has also graduated from the Standard Oil Sales Engineering School.

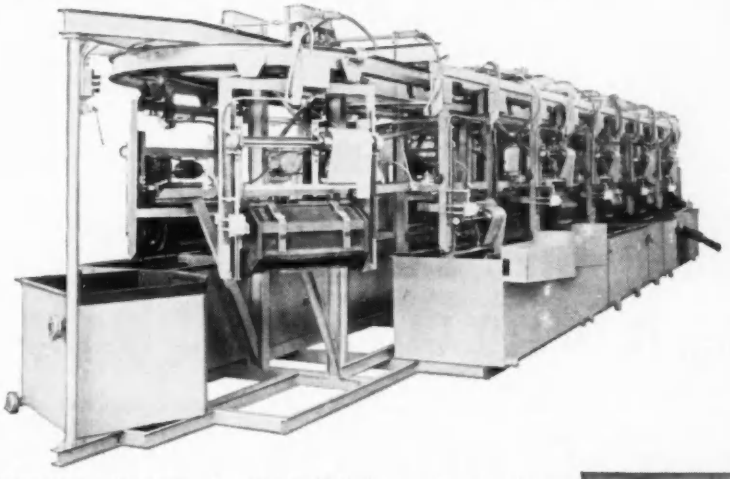
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Nickel steels give shafts and gears the strength to rip up 30-yard loads

With downward pressure from double-acting hydraulic bowl jacks, the Allis-Chalmers TS-360 quickly scoops up 30-yard loads, speeds them to fill areas, dumps them out with forced ejection.

Shafts and gearing stand a merciless shock load when the cutter digs in, brutally sustained as the scraper rips ahead. To combat these stresses, transmission and drive components are designed around the special combinations of properties provided by five types of nickel alloy steels—each making a unique contribution of strength, shock-resistance, wear-resistance.

In the Fuller transmission, reverse gears and countershaft...among the most heavily stressed components... are made of AISI 2515 steel, containing 5% Nickel for extra toughness and wear-resistance. Gears and main shaft are 4320, delivering high core hardness and torsional strength.

In the final drive, Allis-Chalmers gets the benefit of responsive, economical heat-treatment properties for high levels of resistance to wear, shock and fatigue. Requirements are liberally met by spiral bevel ring gear and pinion of AISI 4320 nickel alloy steel; bevel pinions and side gears of 8620 Ni-Cr-Mo steel; bull gears, idlers, and pinions of 8627. Hitch-pin bushing is a carburized 4620 casting, and several parts are cast from 8630.

How about your design requirements? These and other nickel alloy steels—all readily available—can deliver specific combinations of properties for strength, wear-resistance, and overall economy. For useful data, and for help in solving materials-selection problems, simply write to Inco.

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AUTOMOTIVE INDUSTRIES

A CHILTON MAGAZINE • PUBLISHED SEMI-MONTHLY

OCTOBER 1, 1960

Passenger Cars • Trucks • Buses • Aircraft • Tractors • Engines • Bodies • Trailers • Road Machinery • Farm Machinery • Parts and Components • Accessories • Production and Processing Equipment • Design • Production • Engineering • Management

VOL. 123 No. 7

Features • • •

A Preview of 1961 CARS

Also—20 New Product Items and other Features such as Machinery News, Metals, Airbriefs, and Automation News Report

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NBP National Business Publications, Inc.

SBME Society of Business Magazine Editors

BPA Business Publications Audit of Circulation

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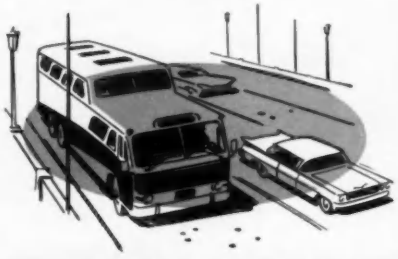
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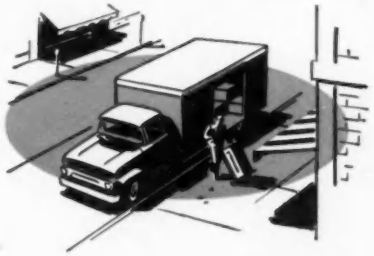
BENDIX PROP SHAFT PARKING BRAKE

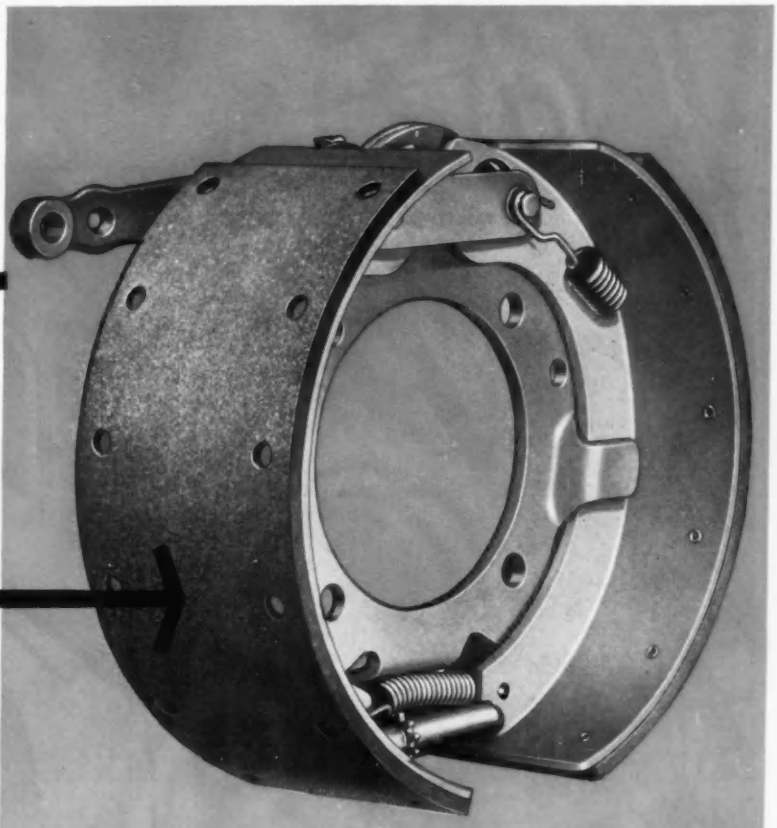
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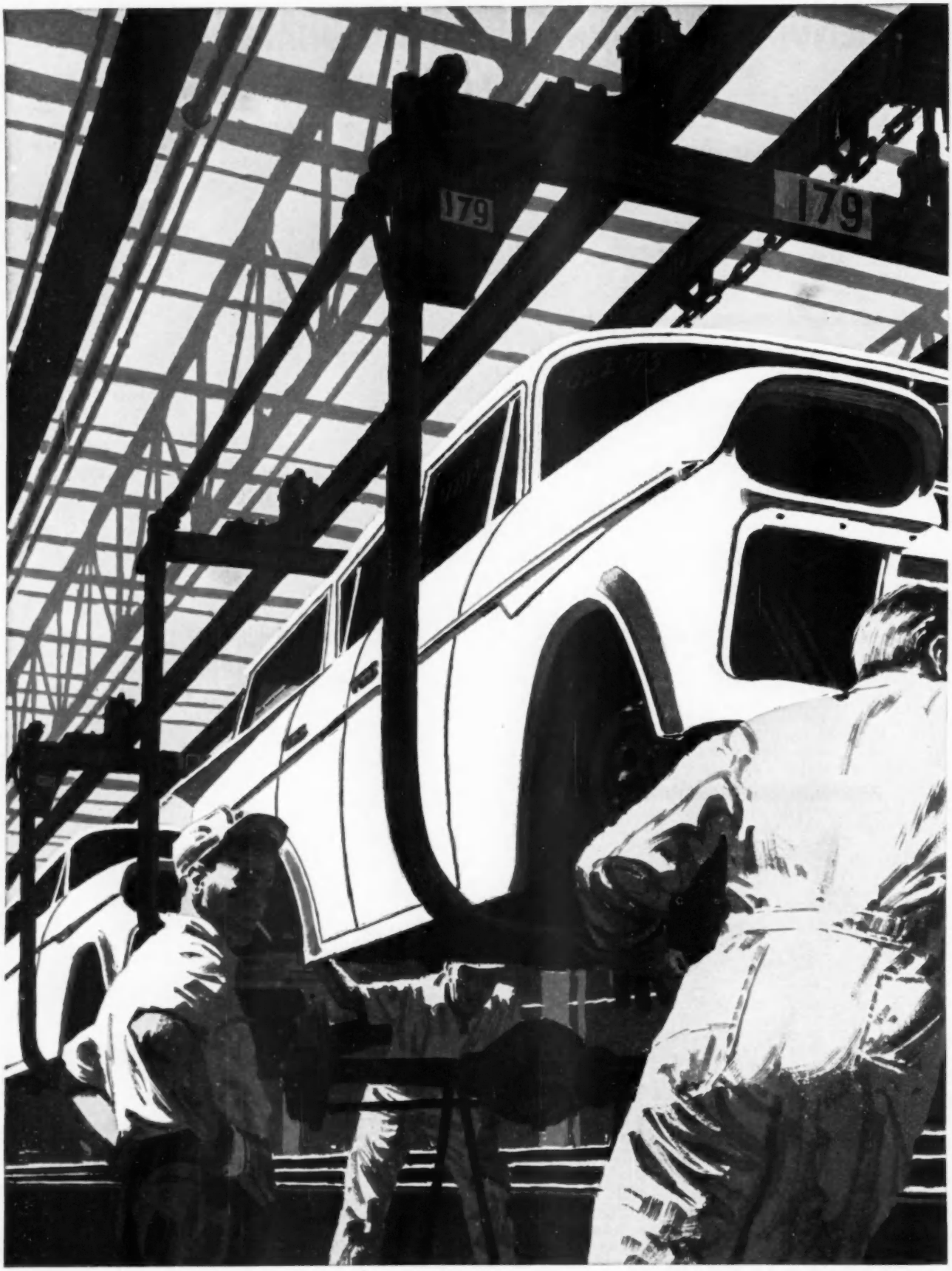
Rugged, light in weight and simple in design, the Bendix Prop Shaft Parking Brake meets the most exacting standards of the industry, and all I.C.C. and state requirements.

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179
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CALENDAR

OF COMING SHOWS AND MEETINGS

ASME, Rubber & Plastics Confer., Erie, Pa. .....Oct. 9-12

SAE, National Aeronautic Meeting, Los Angeles .....Oct. 10-14

Cast Bronze Bearing Institute, 1960 Annual Meeting, Asheville, N. C. Oct. 12

32nd Annual Meeting, The Gray Iron Founders Society, Cincinnati, ...Oct. 12-14

IMS, National Industrial Engineering and Management Clinic, Chicago .....Oct. 13-14

24th Annual National Engineering & Management Clinic, Industrial Management Society, Chicago .....Oct. 13-14

National Automobile Show, Cobo Hall, Detroit .....Oct. 15-23

Magnesium Association Annual Convention, Cleveland .....Oct. 17-18

Lubrication Conference, A S M E - ASLE, Boston .....Oct. 17-19

42nd National Metal Exposition and Congress, Philadelphia ....Oct. 17-21

"Heat Processing of Stainless Steel" Symposium, IHEA-ASM, Philadelphia, 9:00 A. M. to Noon ..Oct. 18

SPI: "Tooling for the Plastics Industry," New York City.....Oct. 19

1960 Fleet Maintenance Exposition, New York City .....Oct. 24-27

Technical Meeting and Products Show, Spring Mfg. Assoc., Chicago .....Oct. 25-27

15th Annual Technical Exposition, American Society of Body Engineers, Detroit .....Oct. 26-28

Material Handling Institute Show, Louisville, Ky. .....Nov. 1-3

American Institute of Industrial Engineers, Annual Regional Conference and Convention, Boston .....Nov. 3-4

The Society of Die Casting Engineers, Die Casting Exposition and Congress, Detroit .....Nov. 8-11

ASTME, Western Tool Show, Los Angeles .....Nov. 14-19

ASME, Winter Annual Meeting, New York .....Nov. 26-Dec. 1

Semi-Annual Meeting, Malleable Founders Society, Cleveland, Dec. 2

Automotive Electric Association, 43rd Annual Meeting and 24th Annual Mfg.-Dist. Conference, Chicago .....Dec. 2-9

Industrial Building Exposition and Congress, New York .....Dec. 12-15

SAE, International Congress and Exposition, Chicago ....Jan. 9-13, '61

ISA, Winter Instrument-Automation Conference & Exhibit, St. Louis .....Jan. 16-19

29th Annual Meeting, Institute of the Aeronautical Science, New York .....Jan. 23-25

13th Western Metal Exposition & Congress, Detroit .....Mar. 20-24

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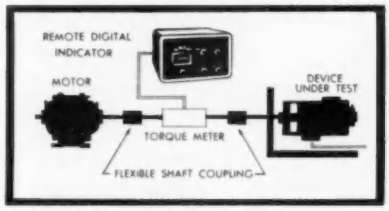
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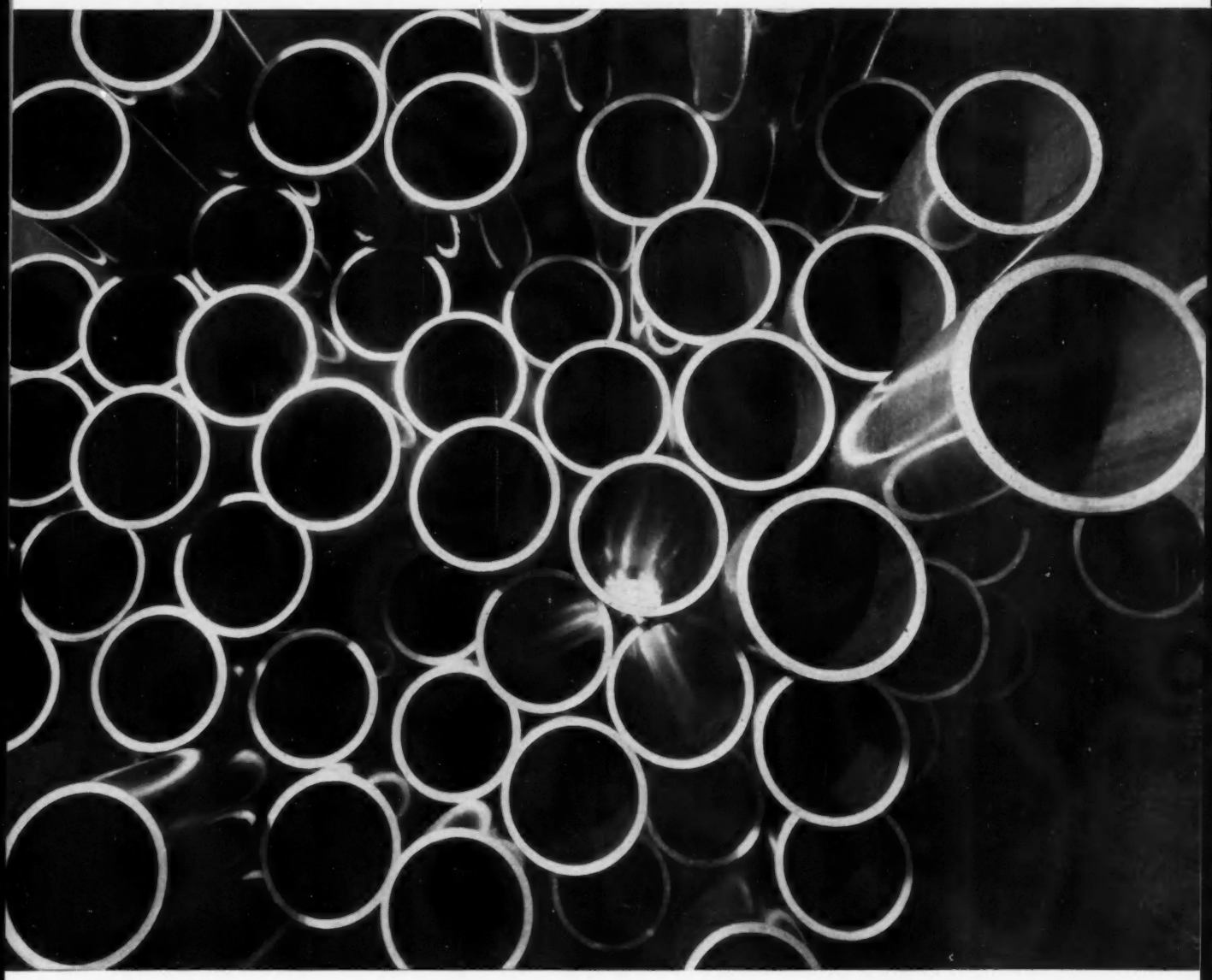
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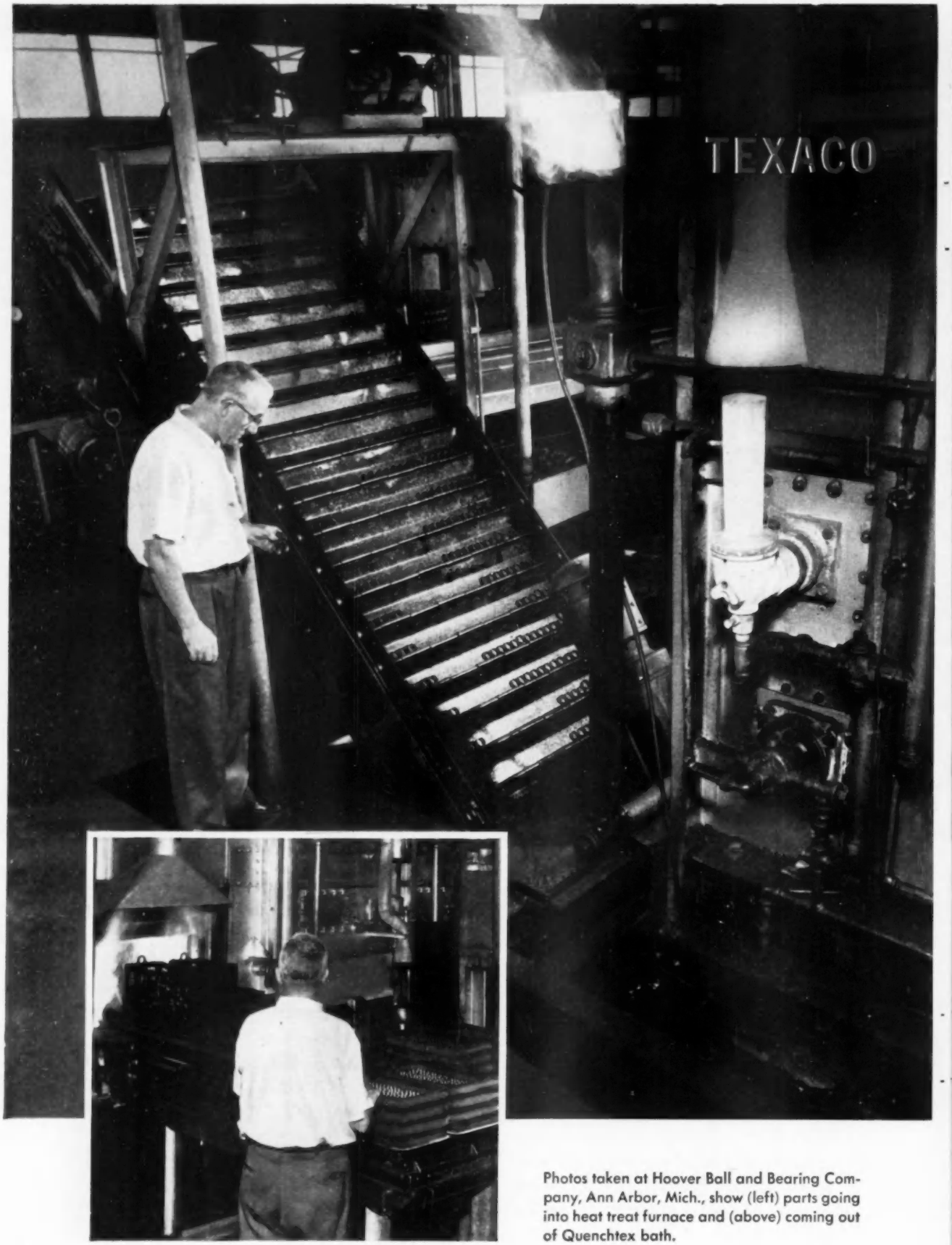
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Photos taken at Hoover Ball and Bearing Company, Ann Arbor, Mich., show (left) parts going into heat treat furnace and (above) coming out of Quenchtex bath.



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with improved grain structure... no darkening of metal...longer bath life...

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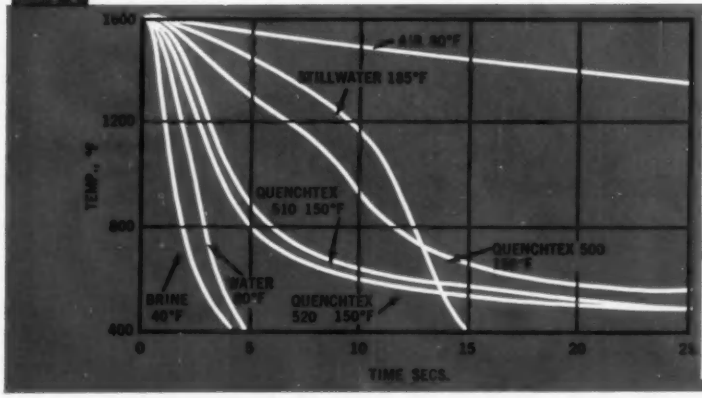


Chart shows cooling rates of several quenching media including QUENCHTEX 500, 510 and 520.

TEXACO MARQUENCH FOR HOT OIL QUENCHING

For products where full hardness combined with minimum distortion is required—gears, ball and roller bearings, bearing races, etc.—hot oil quenching with MARQUENCH can help reduce the number of rejects, increase product load capacities, and in some cases permit closer tolerances before quenching.

Chart shows cooling rates of several quenching media including QUENCHTEX 500, 510 and 520.

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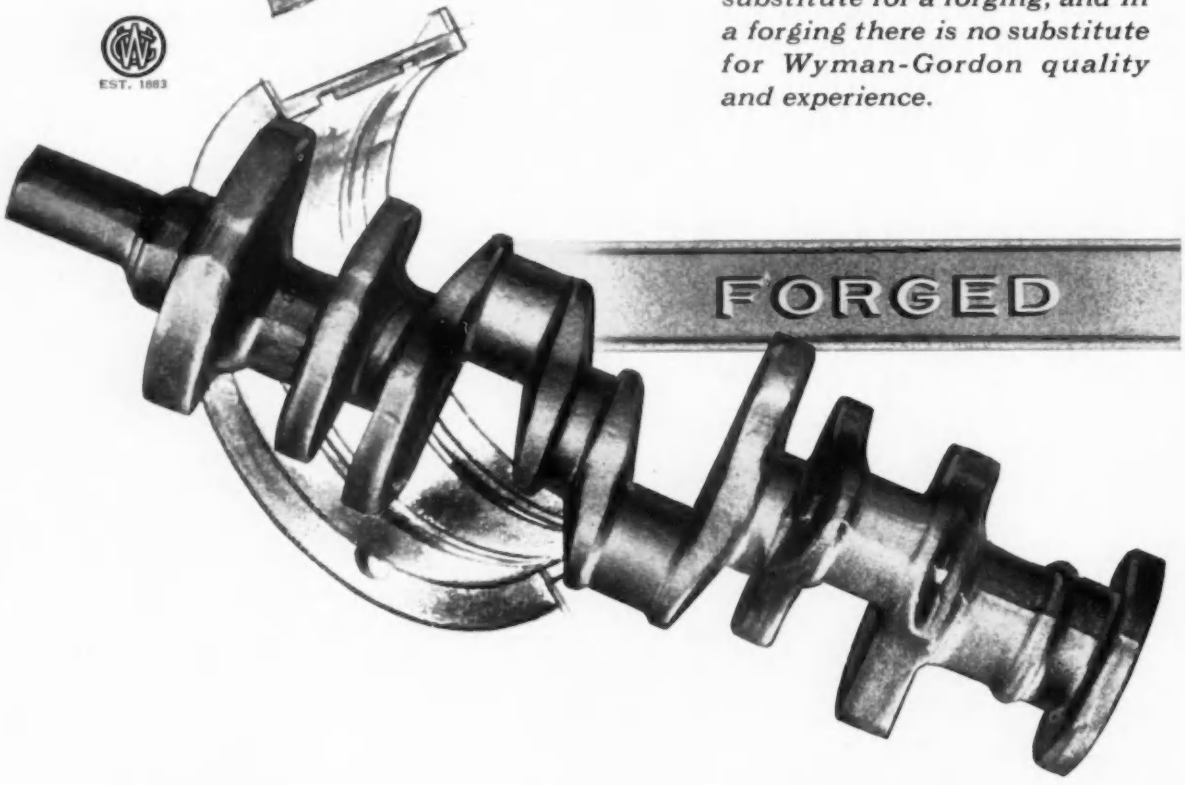


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FORGINGS

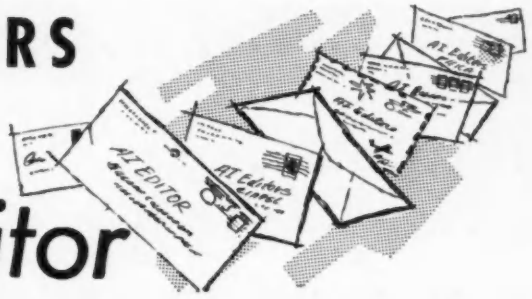
of Aluminum Magnesium Steel Titanium . . . and Beryllium Molybdenum Columbium and other uncommon materials

HARVEY ILLINOIS — WORCESTER MASSACHUSETTS — DETROIT MICHIGAN

GRAFTON MASSACHUSETTS — LOS ANGELES CALIFORNIA — PALO ALTO CALIFORNIA — FORT WORTH TEXAS

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LETTERS to the Editor



Readers' opinions or requests for additional information on material appearing in the editorial pages of AUTOMOTIVE INDUSTRIES are invited for this column. No unsigned letters will be considered, but names will be withheld on request. Address *Letters to the Editor*, AUTOMOTIVE INDUSTRIES, 56th & Chestnut Sts., Philadelphia 39, Pa.

AI PLAUDIT

Thank you very much for the editorial in your August 1 issue of AUTOMOTIVE INDUSTRIES. This is fine writing. I have since been circulating your words on the management level here at the plant.

You have indeed caught the full import of what we are trying to do. In appreciation of your fine effort, if for no other reason, we shall furnish you additional material and pictures as they become available.

Thank you again for your sound analysis and encouraging words.

H. C. Yost
Director of Reliability
Electronics Division
General Motors Corp.
Milwaukee, Wis.

READER SERVICE

In the "Tabloid Section" of your September 1 issue of AUTOMOTIVE INDUSTRIES, you mentioned a broad survey of developments in composite materials and structures that was made for the Army. Also mentioned was an Army materials review highlighting polymers and plastics.

We are interested in receiving copies of these two reports and would appreciate your telling us the address and names of people to write.

R. E. Arndt
Industrial Engineer
Walker Mfg. Co.
Racine, Wis.

● *"Composite Materials and Composite Structures," $7.00, PB 161443, Office of Technical Services, Business and Defense Admin., U. S. Dept. of Commerce, Washington 25, D. C. Also "Sixth Materials Review," $2.25, PB 161463, same address—Ed.*

CORRESPONDENCE COURSE

In our promotional efforts this year we again turn to you for assistance in publicizing the correspondence course, "The Economics of National Security," offered by this College.

We would be very grateful if you would publish the enclosed news release in a forthcoming issue of your publication. As a result of similar articles appearing in various periodicals last year, many responsible American business and community leaders enrolled in the course.

The world is torn with strife and dissensions which threaten our vital interests, and indeed our very existence. Only through a better understanding by our leading citizens of the interrelationship of the various aspects of national security will we be able to effectively resolve the complex demands placed on our economy as a result of the current global power struggle.

Evan M. Houseman
Major General, USA
Deputy Commandant
School of Extension Studies

MAKING PRODUCTION PAY

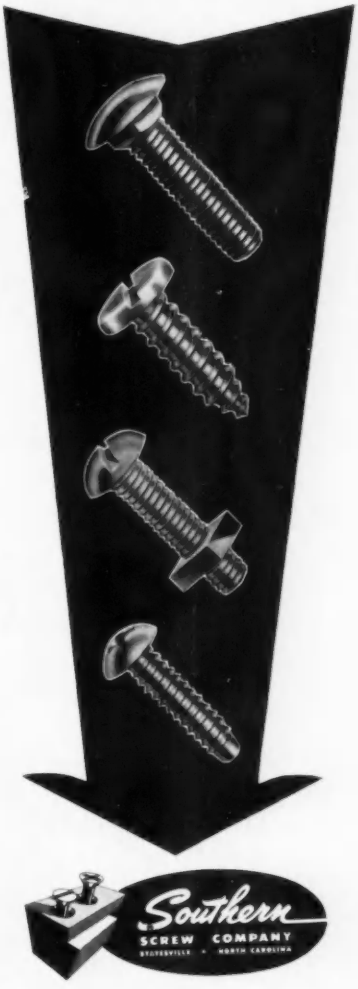
Thank you for mentioning Lees-Bradner in your September 1 issue —Making Production Pay.

The September 6 (Midwest Edition) Wall Street Journal advertisement was also well done.

So much of the NMTBA Chicago datelines have been about the exotic; little has been printed about the realistic . . . we like the article.

G. T. Bradner
Lees-Bradner Co.
Cleveland, Ohio

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working with

Du Pont Plastics . . .



Lubricator manufactured by Walker Mfg. Co., Racine, Wis. Pump housing and cap molded of DELRIN by G. Felsenthal & Sons, Chicago, Ill. Connecting line of ZYTEL produced by Polymer Corp., Reading, Pa. Manifolds and fittings of ZYTEL molded by Flambeau Plastics, Baraboo, Wis. The reservoir of ZYTEL is by Rockford Molded Products, Rockford, Ill.

for automatic lubricating system solves tough problems by using ZYTEL® and DELRIN®

A greatly improved central automatic lubricator using many parts of Du Pont ZYTEL nylon resin and Du Pont DELRIN acetal resin has won a First Award in *Materials in Design Engineering's* 4th Annual Competition. Because the system was designed for use on vehicles, the materials used had to meet a wide range of exacting conditions. The lubricator was designed to operate in temperatures ranging from –25°F. to 225°F., at pressures ranging from 40 psi to 90 psi and in contact with mineral lubricants. ■ With these requirements in mind, the designers selected Du Pont ZYTEL nylon resins for the three main parts of the reservoir assembly, for the manifold and for the connecting line between pump and manifold. The variety of compositions of ZYTEL offers designers wide latitude in selecting the resin with the best balance of properties for each specific job. By careful selection, the parts of ZYTEL in the Walker Lubricator provide the toughness, corrosion resistance and flexibility required under the conditions of use . . . and are economical. ■ For the pump housing, new DELRIN acetal resin was chosen. The rigid molding has excellent dimensional stability and a low coefficient of friction—giving long plunger life. The housing of DELRIN is resistant to mineral lubricants and has an excellent fatigue life in oil. An attractive cost saving was also attained: parts of DELRIN could be molded to finished dimensions on a mass-production basis, and required no machining. ■ This is another example of the performance and cost advantages made possible by Du Pont's versatile engineering materials for the auto industry. Find out more about properties and applications relating to *your* field by mailing the coupon below.

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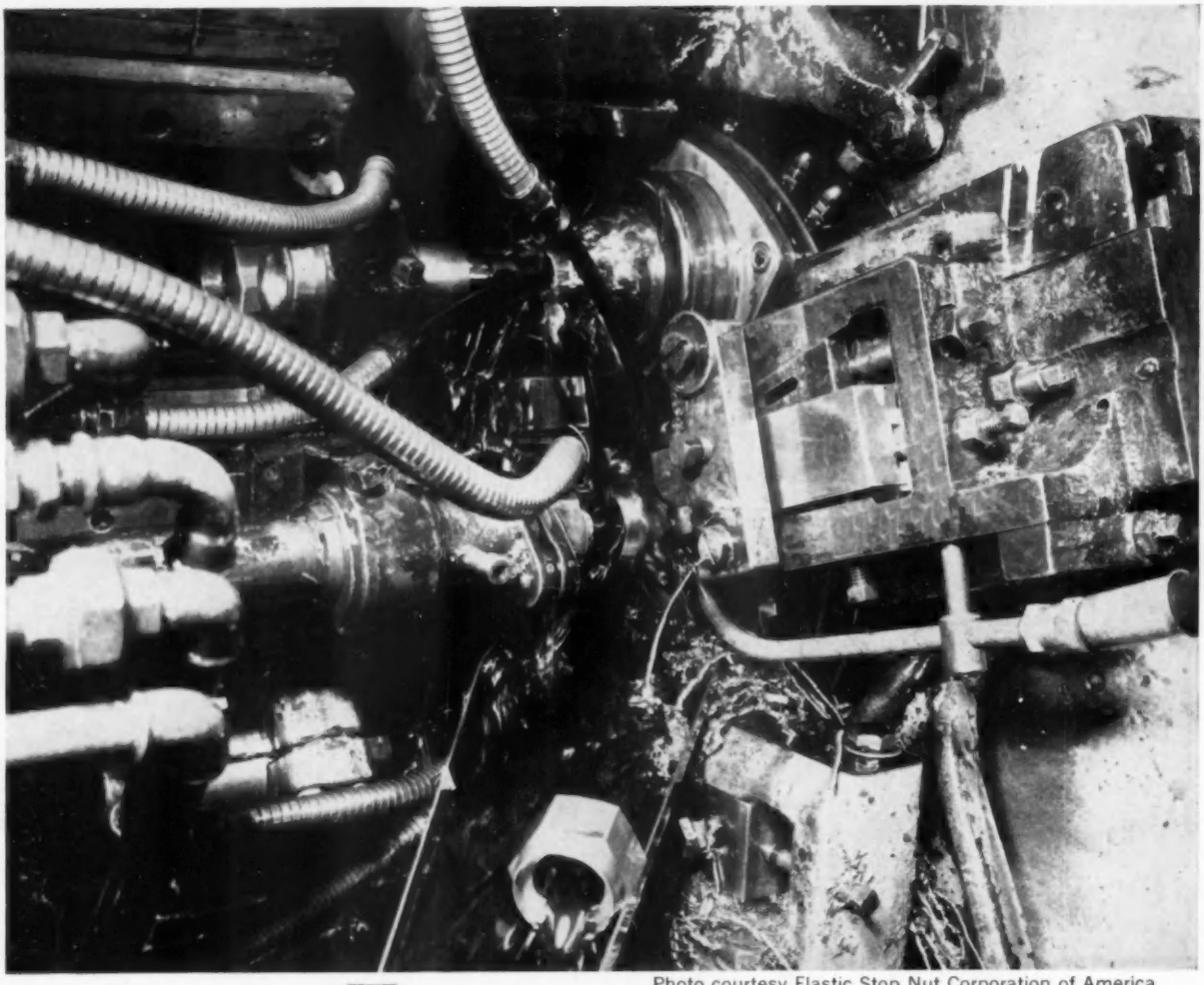


Photo courtesy Elastic Stop Nut Corporation of America

Nuts . . . ESNA makes millions of them from Aristoloy Electric Furnace Steel

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Aristoloy Electric Furnace Steels, carefully controlled from melt shop to finishing operations, meet specifications for this and other applications requiring steel of uniform quality.

For complete information about Aristoloy blooms, slabs, billets and bars, in carbon, alloy, stainless and leaded, call the Copperweld representative in your nearest large city . . . or write for NEW PRODUCTS & FACILITIES CATALOG.



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Circle 114 on Inquiry Card for more data

NEWS

Vol. 123, No. 7 Oct. 1, 1960

Compact Battle Opens

General Motors Predicts 6.8 Million Sales

By Hugh C. Quinn, Detroit Regional Editor, and C. B. Campbell, News Editor

With four new compact cars joining the market this fall, the inevitable question pops up: Who is going to buy all these new cars?

The established makers of smaller cars do not intend to relinquish sales—in fact, they intend to increase them. Yet the new compact manufacturers expect to make a go of it the first year with substantial sales volumes.

And all the other makers, naturally, plan to uphold or increase their sales. Ford, for instance, has its sights set on "maintaining the compact car leadership" with Falcon, and re-establishing the leadership of the regular Ford in 1961.

6.8 Million Sales Seen

Where, then, will all the compact car buyers come from? Obviously, they won't come out of the woodwork. No one is predicting anything higher than a seven million car market, and even that is too high according to some sages. The official GM prediction, for instance, reads "sales of 6.8 million cars, perhaps as high as seven million."

Some of the buyers of the new compacts will be new to the market—teenagers or others who have never owned automobiles. Others will be trading in the compact they currently drive. Some will trade their small foreign cars, and still others will come from the traditional "low priced three" group of Plymouth, Ford and Chevrolet.

A fifth group will be the medium-price owners who will trade in their big cars for compacts—a long-time Buick owner, for instance, trading for a Buick Special in '61. And still another group will be the one-car families adding a second car.

No market analyst in his right mind would try to establish a true forecast of what the result will be. There will be certain balancing factors. For instance, a Rambler owner might trade on one of the new compacts, but Rambler might,

1961 BRITISH STATION WAGON



B. M. C. station wagon will be marketed as Morris Mini-Traveller and Austin Seven Countryman. It has 35½ cu ft cargo capacity. Built on 84-in. wheelbase, the 129-in. vehicle is powered by transversely-mounted 34 hp engine combined with transmission and front-drive assembly.

at the same time, win a customer from the import market or the two-car market.

"Plus business" is a phrase that is being kicked around like a football. Every established manufacturer thinks he can introduce a new line and still hold on to his old business. Chevrolet did it last year with the compact Corvair, but Ford did not hold its own with the big cars when the Falcon came along.

Yet all three of the entering GM divisions — Buick, Pontiac and Oldsmobile—hope to "sell as many big cars in 1961 as in 1960," and still end up with a respectable "plus" compact sale.

2 Are 'Smaller Cars'

None of these three divisions, incidentally, likes to refer to its new entry as "compact." Buick and Oldsmobile refer to the Special and F-85 as "smaller cars"—part of the regular line. Pontiac's entry is considered a "family" car and not a compact.

Through Sept. 10, the six American compacts sold roughly 1,110,000 units, with Falcon holding a slight lead over Rambler. For the year, they should end up with approximately 1,480,000 sales — depending on what the new compacts do.

Concrete predictions have been as scarce as steam cars, but one did sneak out of Flint last month. Buick is planning on Special sales of 160,000, on top of a boost in regular car sales.

George Romney is looking for a 26 per cent climb in Rambler sales, to about 550,000 for the '61 model year. Chevrolet's E. N. Cole is talking about sales of between 300,000 and 350,000 Corvairs in the coming year.

Chrysler has made no forecast on Valiant or Lancer sales, although sales executive Byron J. Nichols (group vice president-automotive sales) says the American-built compact car market will take at least 35 per cent of the new car market. This would be 2,650,000 in a seven million car year.

Pricing also will make a difference. Tempest, for instance, is dropping down into the Corvair-Falcon-Valiant group, and for this reason Tempest could well become the GM compact leader. Lancer, on the other hand, could disrupt some of the confidence that Dodge gained during the past year with its hot-selling Dart.

The year is bound to be a jigsaw year, with plenty of surprises for everyone—and not the least for the manufacturers themselves.

'61 Cadillac Models Shorter and Fewer

Cadillac doesn't have a compact car for 1961—but the division is bringing out a line-up of shorter and fewer models. With introduction of a short deck six-window sedan later in the model year, the new Cadillacs will be up to seven in. shorter than 1959 models.

Two Eldorado models, the brougham and the Seville coupe, are being dropped this year, leaving only the Biarritz convertible in this top-line series. The net result will be the reduction from 13 to 12 models for the new year.

At the national press showing of the new models, Cadillac General Manager Harold G. Warner stated that 1960 will end with production and sales of more than 155,000 cars, a record for the division. Monthly sales records were set in October, February, March and April. For the 1960 model year, output totaled 142,184 cars in less than 10 months of actual production.

Mr. Warner said Cadillac has made improvements in noise reduction, braking, steering and suspension, among others. Modification of frame and chassis results in more head room, leg room and seating comfort. Relocation of engine and transmission lowers the tunnel height. A new roof crown adds an inch to the height of the '61 Cadillacs.

Door openings have been enlarged. The rear doors, with the center pillar moved forward, open 7.5 in. wider. Sloping windshield pillars and narrower rocker sill stepovers add to the front door opening.

Mr. Warner said that use of lubrication-free bushings and ball joints will eliminate the need for greasing the new Cadillacs. Rubber bushings, for instance, replace metal to metal contact in the new front suspension system.

The new front suspension system cuts the turning radius to 43 ft, three ft less than 1960 cars.

Mr. Warner took the occasion to deny the persistent rumor that a sports-type Cadillac is in the offing. He stated his division has no plans for such a car.

PHYSICAL COMPARISON OF 1961 COMPACT CARS

	Wheelbase (in.)	Overall Length (in.)	Weight (lb.)	ENGINE Type	Displacement	Bhp	Wheels (in.)
Rambler American	100	173	2520**	L-head Six	195.6	90	15
				OHV Six (Alum.)	195.6	125	
Lancer	106.5	189		Slant Six	170	101	13
					225	145	
Valiant	106.5	184	2695*	Slant Six	170	101	13
Corvair	108	180	2440*	Hor. Op.	145	80	13
			2355**	Six (AC)		98	
Rambler Classic Six	108	190	2950**	OHV Six (Alum.)	195.6	127	15
						138	
Rambler Classic Eight	108	190	3290**	V-8	250	200	14
						215	
Lark	108.5	175		OHV Six	170	112	15
				V-8	259	180	
Falcon	109.5	181	2315**	OHV Six	144	85	13
					170	101	
Buick Special	112	188.4		Aluminum V-8	215	150	13
Oldsmobile F-85	112	188	2695*	Aluminum V-8	215	155	13
			2566**				
Pontiac Tempest	112	189		4-cyl. Inc.	194.5	110–155	15
				Aluminum V-8	215	155	
Comet	114	194.8		OHV Six	144	85	13
					170	101	
Dart	118	209.4		Slant Six	225	145	14
				V-8	318	230	

NOTE: * Curb Weight ** Shipping Weight.

Pontiac Div. Aiming At Separate Markets

Pontiac Div. is aiming at two separate markets in 1961 — low-priced and medium-priced. Rather than straddle the two groups with its range of automobiles, Pontiac is entering each market with a separate automobile.

S. E. Knudsen, Pontiac general manager and vice president of General Motors, says the regular Pontiac line will sell about as many cars in the medium price class in 1961 as it did in the model year just ending, which was 396,488 units. This was about 3.5 per cent above the 1959 model run.

In addition, Pontiac is entering its compact Tempest in the low-priced field. Mr. Knudsen told the national press preview of the new cars last month in Detroit that Tempest will compete with Corvair, Valiant, Falcon "and so forth."

The Tempest, although it will be shown at the National Auto Show in Detroit this month, will not go on sale until Nov. 3. This late introduction, according to Mr. Knudsen, is one of the ways Pontiac hopes to boost Tempest sales as a separate line of cars. The month head start for the big cars will give dealers a chance to establish the Pontiac line with the public.

Mr. Knudsen said sales training efforts have been aimed at keeping the Pontiac and the Tempest separate lines of cars.

Tempest is different in more ways than just the announcement date. As reported previously in AI, the 112-in. wheelbase compact has a front-mounted in-line four-cylinder engine, and a transaxle. Mr. Knudsen makes the boast that Tempest is the "first automobile in the world to be produced and marketed with a front-mounted engine and a rear-mounted automatic transmission."

Standard engine is the 195-cu in. four-cylinder in-line, rated at 130 hp. Mr. Knudsen said proving ground tests "consistently" gave 25 mpg at 50 mph, and he made claims of acceleration from zero to 45 mph in 9.5 seconds.

Tempest also will offer four-barrel carburetion rated at 155 hp and an aluminum V-8 at 155 hp (borrowed from the Buick-Oldsmobile compacts).

The standard Pontiacs are four in. shorter and 2.5 in. narrower than 1960 models. Result is a 250-lb weight reduction. There are 15 models in four series.

Master Power Moves

Master Power Corp., a subsidiary of Black & Decker Co., has moved to a new plant in Solon, O., a suburb of Cleveland. It was formerly located in Bedford, O.

Aluminum Engines Available in 6 Cars

The aluminum engine—a year ago nothing but drawing board and prototype—is available this year in no less than six American passenger cars.

Joining pioneer Corvair in 1961 will be Buick Special and Oldsmobile F-85, on a standard-equipment basis, and Pontiac Tempest, Plymouth and Dodge Lancer on an optional basis.

Gallons of ink have been spilled on the B-O-P aluminum V-8 story, but until now the Chrysler aluminum Slant Six has been reported but never confirmed. Now the engine is available in a limited number of Lancers, will be available later in Plymouths and Valiants. This is the engine first reported in AI Jan. 1, 1959.

The Chrysler engine has a die-cast aluminum block, but cast iron head and intake manifold. The manifold may well be switched to aluminum.

COMPACT TEMPEST HAS UNIQUE FEATURES



Four-cylinder engine is modification of right bank of Pontiac V-8 inclined 45 degrees. It displaces 195 cu in. and develops 130 hp. Curved driveshaft connecting front engine and transaxle nearly eliminates center tunnel. The Tempest has a 112-in. wheelbase and is 189.3 in. in length.

NEWS

CONTINUED

Illinois Town Tests Ford's '61 Models

Ford's 1961 models will go on sale with perhaps the most extensive consumer pre-test ever given a new car. For six days, the town of Flora, Ill., (pop. 6000) drove virtually nothing but 1961 Fords, Falcons and Ford trucks.

Some 1374 passenger cars—all white—were distributed to Flora residents for the six-day period prior to Ford's dealer announcement Sept. 29. In addition, more than 200 new model trucks—most of them blue—were put into active service.

First incident: A teenager who left the scene at 100 mph after a minor collision. Nothing serious, however.

Along with the pageant, promotion and good old-fashioned press-agentry, Flora received untold and invaluable publicity, and Ford conducted its routine preview for the national automotive press.

Out of the preview came a flat statement by vehicle marketing manager L. A. Iacocca that Ford intends to maintain its lead in the compact car class and re-establish itself in the leadership of the regular Ford line.

The 1960 Falcon, said Mr. Iacocca, took the compact car lead (from Rambler) after only three months. It will complete its first full year on the market with sales well in excess of 400,000.

Falcon sales for the calendar year through Sept. 10 totaled 319,236 units.

Mr. Iacocca described the 1961 Ford as a car that "virtually takes care of itself." A new grease and lubrication system eliminates the need for all 12 grease fittings on the chassis.

Donald N. Frey, assistant chief engineer for Ford Div., explained that each joint and bearing has a lifetime seal packed with molybdenum disulfide grease, which can never be completely wiped off metal once it has been applied.

Grease fittings are replaced with solid metal plugs, and after 30,000 mi the plugs are removed and the joint or bearing is recharged with molybdenum disulfide grease.

(For complete details of 1961 Ford and Falcon models, see Pages 36 and 37 of this issue.)

Die Casting Congress

At least 10,000 die casting engineers, plant managers, buyers, metalworking production executives, tool and manufacturing engineers, and design engineers and stylists are expected to attend the First National Die Casting Exposition & Congress in the Detroit Artillery Armory Nov. 8-11.

Consumer Credit Rise Of $10 Billion Seen

Consumer credit for automobiles will rise by $10 billion during the next decade, according to estimates by a University of Michigan economist, Prof. James C. T. Mao. He has calculated that total consumer debt for durable goods will double from $40 billion at the end of 1959 to $80 billion by 1970.

By that time, according to Prof. Mao, four out of five households will own automobiles (presently three out of four), and 20 per cent of all households will have at least two cars (14 per cent today).

Piper Record Net?

William T. Piper, president of Piper Aircraft, expects sales of about $40 million for the year ending Sept. 30. Projected sales for fiscal 1961 are pegged at $42 million.

Piper will introduce the new single engine, low-wing, all-metal Cherokee in 1961 with a standard price tag of $9500. Piper also will market a new two-passenger aircraft in the $6000 price range.

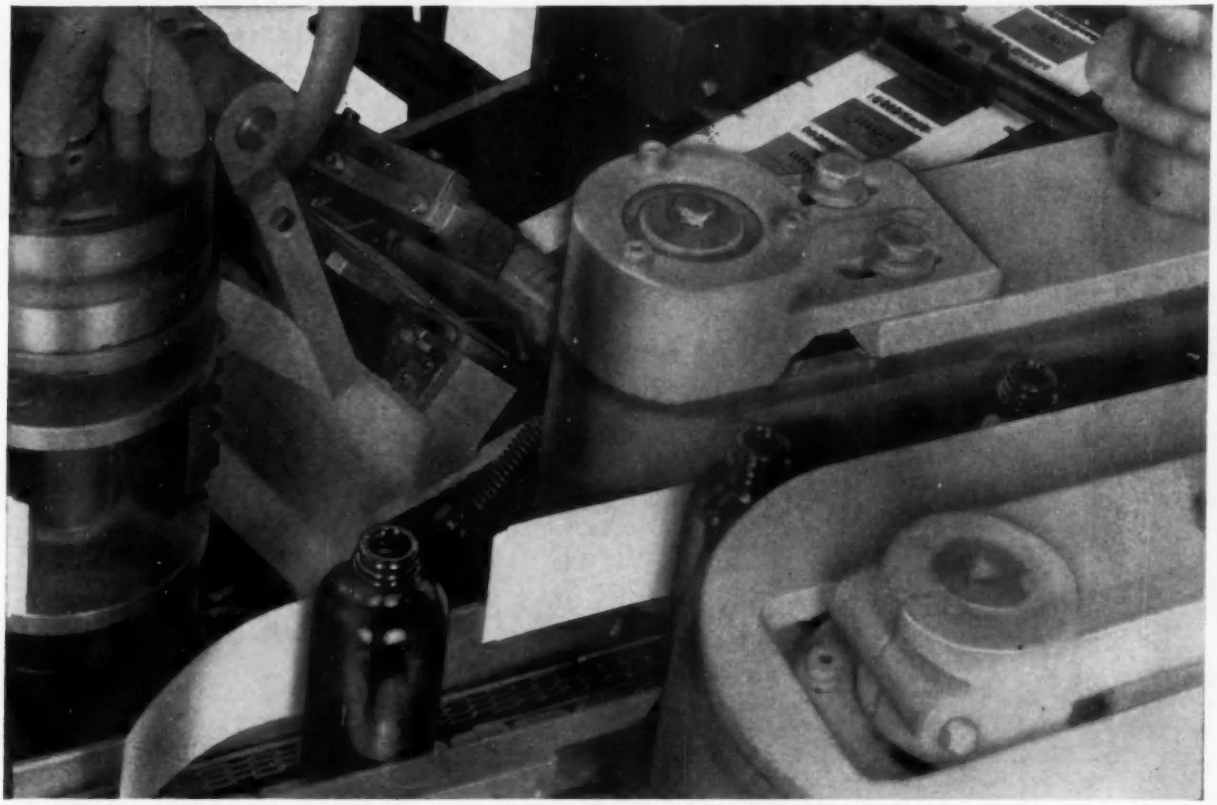
MINING AND QUARRYING GIANT



Mack Truck is producing this 45-ton M-45SX with 450-hp Diesel engine, four-wheel drive, six-wheel unit, power steering, and eight-speed transmission. Braking is provided by front air brakes and rear air-hydraulic brakes.

Another new development using

B.F.Goodrich Chemical *raw materials*



Heat Seal label stock like that being used here is made using Hycar by The Brown-Bridge Mills, Inc., Troy, Ohio. Blocking temperature is 135°F., activation temperature, 190°F., with sealing range from 275 to 375°. B.F.Goodrich Chemical Company supplies the Hycar nitrile rubber.

High speed label stock gets adhesive strength from Hycar

This paper for high speed production labeling is coated with an adhesive made with specially-compounded Hycar polyacrylic latex. It is designed for delayed action use on machines labeling bottles of drugs, cosmetics and other liquids. It is also used on a wide variety of other surfaces after being heated and then pressure-applied.

Hycar produces adhesives entirely different from those made with natural rubber—curing to form high strength bonds on many types of material where other adhesives will not produce desired long-lasting bonds. For example, this paper manufacturer recommends its use for such broadly diversified materials as metal foil, hard rubber, wood and some textiles.

Hycar also gives improved shelf life in cements, simplifying inventory problems, and good color in dried films. Specific information on many uses of Hycar nitrile rubber in adhesives is available. For more facts, write Dept. FL-5, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

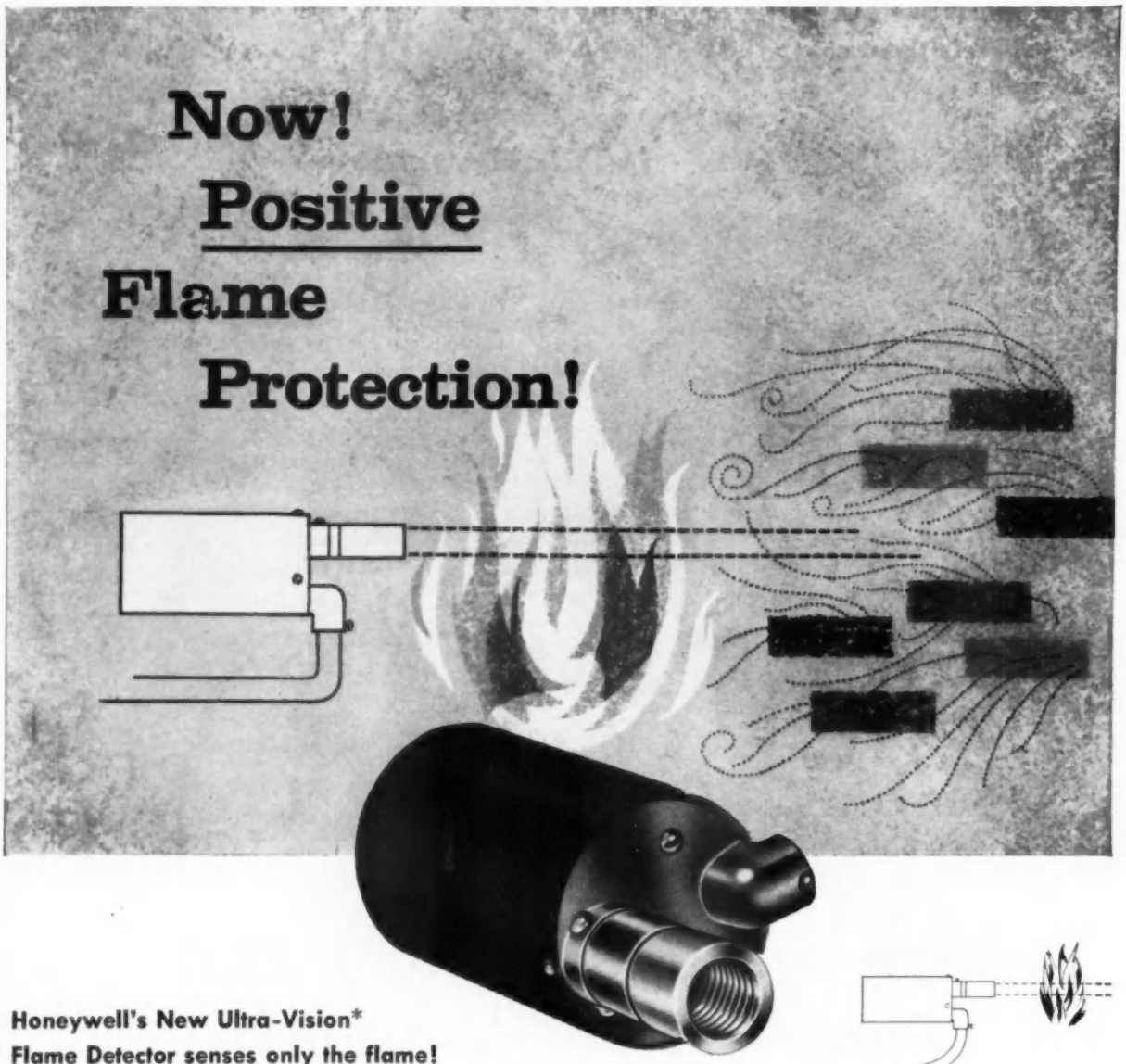
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Now! Positive Flame Protection!

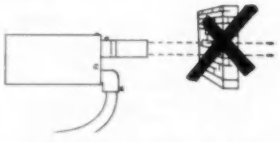


Honeywell's New Ultra-Vision* Flame Detector senses only the flame!

No more hot refractory hold-ins! This new Ultra-Vision Flame Detector responds to nothing but the ultraviolet energy given off by flame and sparks. It's the *only* visual flame detector that can tell the difference between real flame and red-hot refractory or glowing carbon. At last you can be *absolutely sure* that fuel delivery will be stopped in the absence of flame.

Only this compact new control simplifies flame supervision of both single and multiple burners. The Ultra-Vision Detector, not being sensitive to a hot refractory, can be aimed at each individual flame in the most convenient way. Actually pays for itself in simplified installation and maintenance. For all gas, oil and combination gas-oil installations. Get complete details from your nearby Honeywell field engineer. Call him today. Or, write for Bulletin 95-2776, Minneapolis-Honeywell, Minneapolis 8, Minnesota.

Ultra-Vision Flame Detector sights flame of all fuels.



Not affected in any way by a hot refractory or glowing carbon.

* *Trademark*

Honeywell

First in Control

SINCE 1885

75 YEARS PIONEERING THE FUTURE

Circle 116 on Inquiry Card for more data

NEWS

FEATURES

Ford Econoline Trucks Use Falcon Parts

Pick-up, Van, and eight-passenger Station Bus models represent the Econoline Series of light commercial vehicles introduced by Ford Motor Co. Mounted on 90-in. wheelbase, these vehicles employ many Falcon chassis components with the 144.3-cu in. six-cylinder engine as standard. Positive crankcase ventilation to control emissions is standard equipment on these vehicles as well as on many other commercial vehicles in the 1961 Ford line.

The new models supplement the Falcon Ranchero and Falcon Sedan Delivery, as well as the F-100 pickup and the new P-100 multi-stop parcel delivery. The Econoline Van replaces the F-100 panel, which is discontinued.

Apart from using the Falcon chassis components, the three new vehicles use the same front doors and front end sheet metal.

Unitized bodies eliminate the need for a separate frame. Overall length of the vehicles is 168.4-in.

With standard suspension and tires, the three vehicles have a payload rating of 929 lb. Additional spring leaves and larger tires, an RPO feature, raise maximum payloads to 1679-lb for the Pickup and Van, and 1469-lb for the Bus. Curb weights in standard versions are 2389, 2446, and 2659-lb respectively.

The engine housing has a top cover with a quick disconnect hinge at the rear and a toggle clamp latch at the front. The lower housing is in three sections. These features provide easy access to the engine, making it possible to overhaul the unit without removing it.

The three-speed transmission, with synchronizers for second and third gears, is similar to the standard Ford transmission but has different gear ratios: 3.09 to 1 in first; 1.92 to 1 in second; direct in third; 3.67 to 1 in reverse. The gear selector lever is on the steering column.

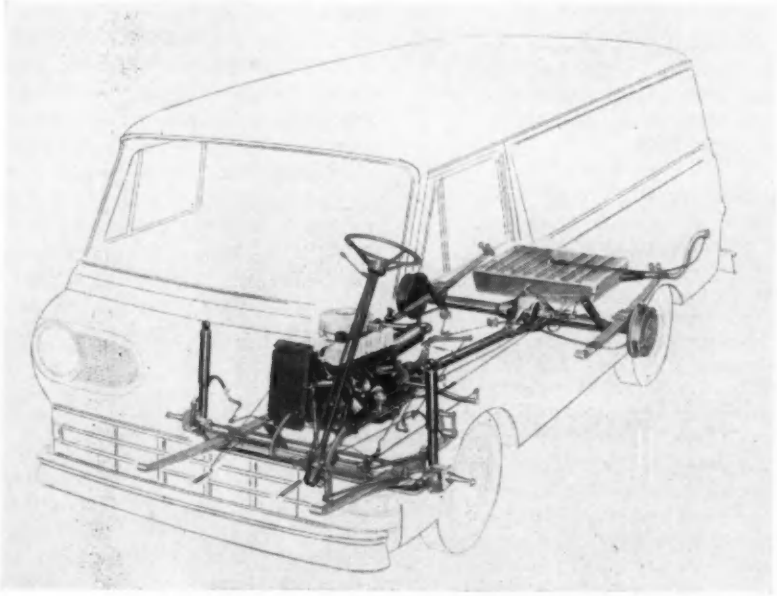
The 8.5-in. heavy duty clutch is operated by a release rod and equalizer bar, the clutch pedal and equalizer bar assembly being connected by a release rod located parallel to the left longitudinal body member and engine.

Axle shafts are of tapered diameter flange type, with five bolts pressed into the flange for wheel mounting. Standard axle ratio is 3.50 to 1, with 4.0 to 1 optional.

Front suspension consists of a conventional solid I-beam axle mounted on four-leaf springs. There is a front-mounted stabilizer bar and wide-mounted shock absorbers. Rear suspension is of Hotchkiss type with semi-elliptical leaf springs. Five-leaf springs with 685-lb capacity are standard; six-leaf progressive springs with 980-lb capacity are optional.

The brake system is the same for the three vehicles; 10-in. duo-servo with 167.5-sq in. lining area. Front brakes are 2½-in. wide; rear, 1¾-in. wide.

The 12-volt electrical system uses components from other Ford vehicles, with a 25-amp generator standard, and a 30-amp low cut-in generator and regulator optional.



Ford Econoline Trucks Use Falcon Parts

AI TABLOID

Many nickel alloys are used in Diesel engines to provide them with the best mechanical properties to stand up under severe operating conditions.

* * *

During the first six months of 1960, 4412 units of utility and executive aircraft worth $86 million were shipped. This is a unit increase of 8½ per cent over the same period last year.

* * *

Steel and iron accounted for nearly 9.5 tons of every 10 tons of major ferrous and nonferrous metals produced in the U. S. during the last 10 years. The combined production of ferrous and nonferrous metals averaged more than 113.5 million net tons yearly, from 1950 through 1959.

* * *

Two reports for the Navy summarize progress in developing a digital-to-analog decoder using closed-loop sample data techniques.

* * *

Steel wire is woven into cloth eight times finer than the finest weave of ladies' hosiery to produce some of the filters used in industry.

* * *

There is more rubber inside today's automobile than outside. This includes window seals, wire insulation, matting, foam cushioning, belts, battery cases, radiator hose and motor mounts.

* * *

Short time tension and compression load carrying properties of four sheet materials for aircraft are evaluated in a research report prepared for the Air Force. Two other metals reports also are available. One discusses procedures and results of fatigue tests on three aluminum alloys. The other discusses Vickers hardness and tensile strength of SAE 4340 steel.

* * *

Hollow automobile crankshafts made of ductile iron are about 40 per cent lighter than those made of forged steel.

Thirty-six steel-covered counterweights, each weighing 200 tons and measuring 13 ft in diameter, will assure efficient operation of the world's most powerful radio station now being built at Cutler, Me. The counterweights will hold the antenna taut.

* * *

Ice is prevented from forming on the glass windshields of airplanes by the use of heat produced by fine nickel-chromium electrical resistance wire imbedded in the glass.

* * *

Engineers say motorists with air-conditioned autos tend to drive faster because they gauge speed as much by sound as by their speedometers. Lack of sound when windows are closed gives the motorist a feeling of security not necessarily relative to speed.

* * *

Machining characteristics for 25 high strength, thermal resistant alloys are specified and presented in graphs in a report of Air Force-sponsored research. Behavior of the 25 alloys was studied during cutting, grinding, turning, milling, tapping, and drilling operations.

* * *

U. S. consumption of new rubber amounted to 138,425 long tons in June, 1960, compared to 133,256 tons in May, 1960, and 139,596 tons in June, 1959.

* * *

Explosive forgings made from aluminum alloys can be reproduced reliably, provided the design has no extreme contours. During 14 months of explosive forging tests, researchers found that high explosives proved feasible for producing close-tolerance, one-sided, closed-die aluminum alloy forgings for aircraft and missiles.

* * *

A simplified method for predicting the electrical performance of field emission cathodes has been presented in a research report. Also available are reports on electro-optical devices and organic semi-conductors.

Goodrich De-Icer For Light Planes

B. F. Goodrich Co. has announced development of a new electrical propeller de-icing system for light twin-engine planes. Goodrich said the system has been selected by the Navy as equipment for 20 Piper Aztec planes purchased recently for personnel transportation.

P. W. Perdrau, general manager of Goodrich's BFG Div., said the system will be supplied in kit form. He added it is a scaled-down version of electrical systems on much larger planes.

Mr. Perdrau said the system's cost is comparable with conventional alcohol de-icers that weigh two to five times as much, and that it provides protection for unlimited periods.

Curtiss-Wright Plans Research Expansion

Curtiss-Wright has revealed plans for expansion and changes of its research activities.

T. Ronald Berner, chairman and chief executive officer, announced three major moves to strengthen Curtiss-Wright's research center at Quehanna, Pa. They include gift of an experimental nuclear reactor to Pennsylvania State University; sale of the Curon Div. to Reeves Brothers, inc., a textile company, and sale of the Santa Barbara research facilities to General Motors.

Roensch Gets Post

Max M. Roensch has been elected chairman of the Detroit Section, Society of Automotive Engineers. He is assistant chief engineer in charge of experimental operations for Chevrolet Motor Div.

Easy Loading Features Corvair 95 Trucks

Comprising a panel delivery and two pickup models, Chevrolet's Corvair 95 line incorporates provisions for easy loading and cargo accessibility. One of the pickup models has a swing-down, side-loading ramp.

With a 95-in. wheelbase and short overall length of less than 15 ft, it has a short turning radius and is highly maneuverable.

The new series is powered by the 80-hp aircooled Corvair six-cylinder engine and transaxle power unit mounted at the rear. Other features are unit-frame construction, independent suspension at all four wheels, and almost equal load weight distribution between front and rear wheels.

The Corvan panel delivery is 70 in. wide with an overall height of 68.5 in. Cargo space is 191 cu. ft. with a payload rating of 1800 lb for a maximum GVW of 4600 lb.

The Loadside and Rampside pickup models are rated at 1900 lb payload, and feature a grain-tight box of 80 cu ft capacity.

Load floor height of Corvair 95 trucks at the side opening is less than 14 in. from the ground and rear door or tailgate loading height is only 26.5 in.

The vehicles are designed so that most of the payload is located between the front and rear wheels.

A three-speed synchromesh transmission is standard equipment, with a four-speed synchromesh transmission or the Powerglide automatic transmission available as a factory-installed option on all models.

The flywheel used with either the three-speed or four-speed transmission has a center section which permits it to flex slightly, absorbing radial and torsional vibrations in the crankshaft. A clutch of 9.12 in. disk facing diameter is used with a total pressure load of 1000 to 1200 lb on the clutch disk.

Hydraulic brakes are duo-servo design with 167 sq in. of lining area.

A direct air heater which utilizes engine heat to provide warm air for the passenger compartment is available as either a factory or dealer installed option.



New Chevrolet Corvair 95 Rampside Pickup Truck

Evinrude '61 Outboards Feature Many Advances

The 1961 line of outboard motors just introduced by Evinrude Motors features advancements in functional design, quietness, and convenience.

On the 75-hp Starflite III, offered in two versions, the company has incorporated fixed-jet carburetion, more sound-silencing provisions, and a "Jetstream" design that cuts drag. The Starflite III with Uni-Charger is the luxury model. It has a new A-C alternator, with transistorized regulator, added to the features of the Starflite III. Both of these models are V-4's with a total piston displacement of 89.5 cu in.

The Lark III, Evinrude's electric-starting 40-hp model, ranks next in line, followed by its companion model the manual-starting Big Twin. Other models are the 18-hp Fastwin, the 10-hp Sportwin, the 5½-hp Fisherman, and the 3-hp Lightwin.

Additional sound reduction in the Starflite III, as well as the Lark III has been achieved by lining the motor covers with cellular sound-absorbent material. Also, the air inlets of the Starflite III's have been redesigned with absorbent-lined S-shaped flow passages.

On the V-4 Starflites the electrical safety interlock switch has been relocated to permit starting while in gear at low throttle settings only.

Chairman Reappointed

Harold L. Flowers, director of Weapons Systems and the Forward Project Planning Div. of Goodyear Aircraft Corp., has been renamed chairman of the American Institute of Electrical Engineers' Electronics Committee.

CHECKER ADDS MARATHON SERIES



Checker Motors Corp. has a new series in which sedans are 199.5 in. long, wheelbase is 120 in. and width is 75.5 in. Turning diameter is 37½ ft. A six-cylinder OHV engine produces 122 hp at 4000 rpm.

2 More Industries Join 'Auto Wonderland'

The nation's petroleum and malleable iron foundry industry have entered the big "Auto Wonderland" exhibition to be staged at the National Auto Show in Detroit Oct. 15-23. An additional 33 automotive suppliers also will have exhibits.

The latest entrants bring to 100 the number of industry associations and company groups with exhibits, the Automobile Manufacturers Association, sponsor of the show, announced. Hundreds of individual companies are represented by the exhibitor groups.

"Auto Wonderland" will be a huge show-within-a-show, telling the story of automobile manufacture and of the many industries that contribute to the process. All exhibits will be by industry groups, with institutional rather than commercial content.

The petroleum exhibit, dramatizing the role of one of the nation's biggest industries in the auto age, is sponsored by the American Petroleum Institute. The Malleable Castings Council, with six companies co-operating, sponsors the malleable iron exhibit.

The auto show will dedicate Cobo Hall, Detroit's ultra-modern convention and exhibit building. "Auto Wonderland" will be in a 104,000 sq ft hall below the auto and truck exhibits.

U. S. Firm to Produce France Jet Sports Car

The France Jet sports car will be produced in this country by the Lofstrand Co., of Rockville, Md., Jaques Fisher, president of France Jet Motors, Ltd., has announced.

The contract, signed with J. Slater McHugh, vice president and general manager of Lofstrand, specifies a minimum $5 million a year for production of at least 5000 cars yearly for a five-year period.

The two-seater France Jet is constructed of fiberglass reinforced with aluminum. Other safety features are four-wheel hydraulic brakes and safety belts. There is no door on the driver's side.

Weighing only 870 lb, the France Jet is said to get 65 mpg. It has a top speed of 70 mph and has independent suspension of all four wheels. Its motor is air-cooled.

Mr. Fisher said production will begin Oct. 15, with the first cars due off the line at the end of 1960. Mr. McHugh declared Lofstrand will manufacture parts as well as assemble the cars.

Mercury for 1961 Offers 9 Outboards

Nine 1961 models of Mercury outboard motors, from six to 80 hp, have been announced by the Kiehaefer Corp. Single - lever throttle and shift control for all models, and engineering improvements throughout the line are featured.

New horsepower categories include the 40-hp Merc 350 and 50-hp Merc 500. The prior 35-hp and 60-hp models have been discontinued for '61.

The six-hp 7.2-cu-in. Merc 60 is said to be an entirely new fishing motor in its 1961 version. It has full gear shift, safety clutch (no shear pin), and provision for remote operation. Exhaust, like other Mercury models, is underwater through the propeller hub.

The Mercury model lineup for 1961 consists of the following: six-hp Merc 60, 9.8-hp Merc 100, 15-hp Merc 150, and 22-hp Merc 200 in two cylinders; 40-hp Merc 350, 45-hp Merc 400, and 50-hp Merc 500 in four cylinders; and 70-hp Merc 700 and 80-hp Merc 800 in six cylinders.

Options include long shafts on all four's and six's, as well as on the six-hp Merc 60, for boats with 20-in. transoms. Also, electric-starting on 40-hp and up models; counter-rotating propellers for twin-engine installations of six-cylinder direct-reversing models; and a choice of direct-reversing motor or full-gear-shift lower unit on six-cylinder models.

Trussel Is Named

Jack B. Trussel, sales manager, Mobilift Div., Minneapolis-Moline Co., has been appointed to the Joint Management Groups and Professional Societies Committee of the Material Handling Institute.

Ford Falcon Sedan Delivery Truck

The Falcon sedan delivery model, supplementing the Falcon Ranchero which was announced earlier, has been introduced by Ford Motor Co. It is designed to meet the needs of light, in-city and service operations such as are required by small businesses to transport relatively light weight, small volume cargo.

The 144-cu in. Falcon engine is standard and the 170-cu in. engine optional.

This vehicle resembles the Falcon station wagon, with metal panels replacing the glass areas. Floor space behind the front seat is built up to provide a level load area with 76.2-cu ft. of cargo space. The interior sides are lined with durable hardboard. The tailgate is hinged and has a roll-down window for ventilation.

Wheelbase is 109.5-in. and overall length 189-in., while the width is 70.6-in. The standard gear ratio is 3.5 to 1, with an optional ratio of 3.89 to 1 available with the 144-cu in. engine. The three-speed manual shift transmission is standard. A two-speed automatic transmission is offered at extra cost.

New 20-Ton Crane Has 140-Ft Reach

A new truck crane with a 20-ton lifting capacity has been developed by the Harnischfeger Corp. It is claimed to be able to handle boom lengths 40 per cent longer than any machine in its weight or price category.

The new crane is said to handle boom and jib extensions up to 140 ft in length. It can be equipped with a dragline or clamshell or a pile driver using the unit's standard 40-ft boom.



1961 Ford Falcon Truck

Buick Seeks Patrons From 3 Sources

Buick hopes to draw customers from three sources for its new compact Special. And the Special, according to Buick General Manager Edward D. Rollert, should increase Buick's new car market coverage from 24 per cent to 90 per cent.

Mr. Rollert told a group of automotive writers previewing the new Buick line that the special customers will come from (A) people who want a car that is smaller, yet not a compact; (B) people who now drive compacts; and (C) customers from the traditional low-priced three.

The Special has a horsepower-to-weight ratio comparable to the regular Buicks, Mr. Rollert said. Horsepower in the V-8 aluminum engine is rated at 155. The car weighs about 2700 lb, or 1600 lb lighter than the regular Buicks.

Standard-size Buicks have been trimmed down, too—about two in. narrower and a little shorter than in 1960.

Mr. Rollert said that Buick sales this year are running about two per cent ahead of 1959, and sales since March 20 are five per cent over last year.

Buick's planning volume for 1961 calls for 280,000 standard-size cars and 160,000 Specials. This would be an increase of about 25,000 big cars.

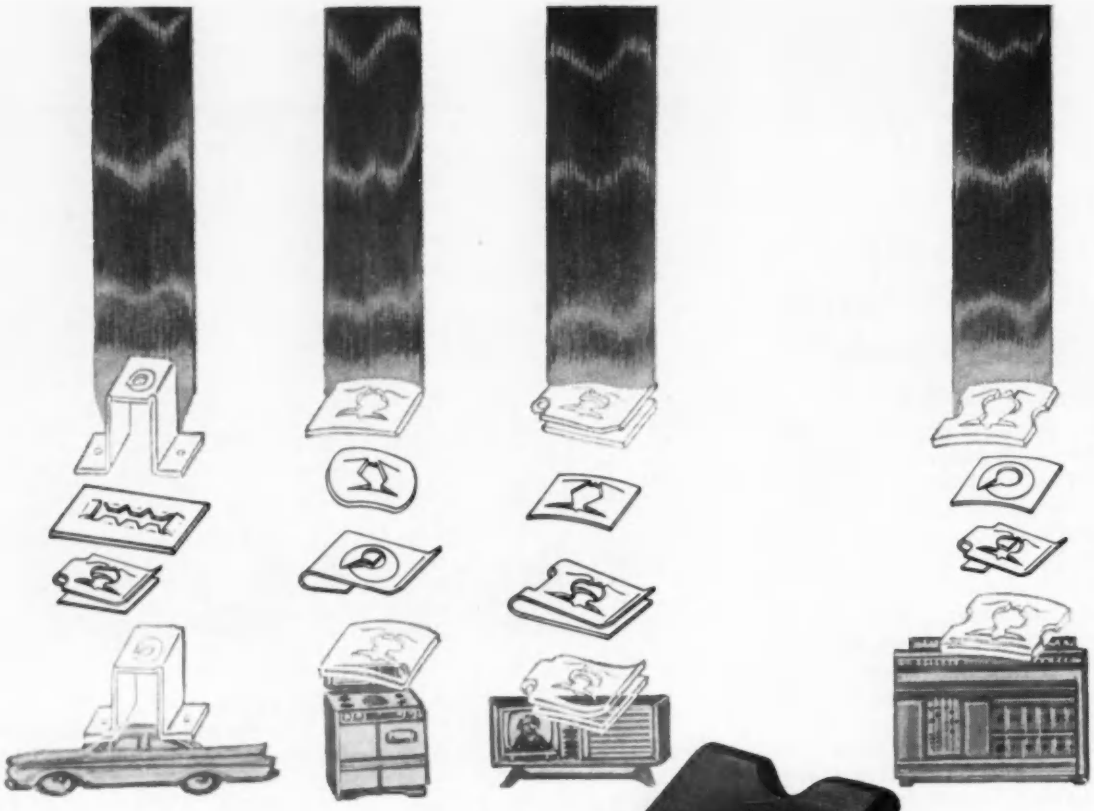
Lowell Kintigh, chief engineer, reported that the Special has turned in 30 to 40 per cent better economy than the standard cars, translated to four or five mpg. The V-8 engine operates on regular gasoline.

The Special will be available in a four-door sedan and a four-door wagon. The standard Buick series—LeSabre, Invicta and Electra—are the same groups as in 1960.

Mr. Rollert based his optimisim for 1961 on three basic points: dealer attitude and enthusiasm, styling of the size '61 Buicks, and introduction of the new Special.

Olin Mathieson Plant

Olin Mathieson Chemical Co. has announced it will build a $13 million plant at Charleston, Tenn., to produce chlorine and caustic soda. Located on a 600-acre site on the Hiwassee River, the plant will have a capacity of 180 tons a day.



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MEN IN THE NEWS



Dana Corp.—William E. Vogel has been promoted to chief engineer-manufacturing, research and development.



Beech Aircraft Corp.—E. C. Burns has been named administrator for special projects.



Budd Co., Automotive Div.—John V. Prestini has been promoted to wheel products sales manager.



Fairchild Engine and Aircraft Corp., Aircraft and Missiles Div.—John J. Murphy has been named works manager.



Garlock, Inc.—John E. Brennan has been named staff assistant to the president.



Caterpillar Tractor Co.—Frank S. Foster (far left) has been appointed manager of defense products sales, and Charles B. Leber has been named advertising manager.

Ethyl Corp.—**C. D. Carter** has been promoted to export sales manager.

Electric Autolite Co., Wire and Cable Div.—**Virgil Steinmeyer** has been promoted to manager.

Firestone Tire & Rubber Co., Firestone Rubber and Latex Products Div.—**Richard A. Riley** has been named president.

Ford Motor Co., Defense Products Group—**G. J. Rauschenbach** has been appointed manager of Huntsville, Ala., office.

Bendix Corp.—**E. R. Nordstrom** has been named director of personnel.

Dana Corp.—**William E. Vogel** has been promoted to chief engineer-manufacturing research and development.

Fairchild Engine and Airplane Corp., Aircraft and Missiles Div.—**John W. Robinson** has been named public relations director.

Rheem Automotive Co.—**John A. Crosby** has been appointed sales manager.

Bendix Corp.—**E. R. Nordstrom** has been named personnel director.

Chicago Pneumatic Tool Co., Automotive Div.—**Alfred E. Bresnahan** has been named field engineering supervisor.

Ford Motor Co., Aeronutronic Div.—**James C. Elms** has been named general operations manager of electronic systems operations.

General Motors Corp., Central Foundry Div.—**Robert A. Titlow** has been promoted to general manager of the Bedford, Ind., plant and **Robert P. Hendrichs** has been named general superintendent of the Jones Mills, Ark., plant.

Chicago Pneumatic Tool Co.—**John Kacmarik** has been named manager of Franklin, Pa., plant.

Federal-Mogul-Bower Bearings, Inc.—**Samuel E. MacArthur** has been promoted to executive assistant to the president.

SKF Industries, Inc., Reed Instrument Bearing Div. — **Francis B. McKee** has been named product engineer.

Allis-Chalmers Mfg. Co. — **R. C. Brown** has been promoted to manager of sales, control department.

Union Carbide Corp., Silicones Div.—**J. C. Malone** has been appointed assistant general manager.

Sperry Rand Corp., Vickers, Inc., Div.—**Dr. W. Wai Chao** has been appointed director of research and development.

B. F. Goodrich Co. — **Jack W. Brandt** has been appointed manager of property, equipment leasehold and investment expenditures and automotive fleet.

Controls Co. of America—**Joseph H. Schellman** has been elected a vice president. He will continue as general manager of the Control Switch Div.

Bendix Corp., Bendix Systems Div.—**Donald G. Speyer** has been promoted to director of contracts.

Allis-Chalmers Mfg. Co., Farm Equipment Div.—**Robert W. Engle** has been promoted to harvester sales manager.

Martin Co.—**A. R. Teasdale, Jr.** has been named technical consultant.

Budd Co., Instruments Div.—**John W. Allen** has been named manager, engineering, non-destructive testing.

Eaton Mfg. Col., Valve Div.—**John T. Lesko** has been appointed engineering manager.

Necrology

Raymond J. Mauer, 71, retired purchasing agent for Detroit Controls Div., American Radiator & Sanitary Corp., died Sept. 12 in Milton Township, Mich.

Denis C. Gaskin, 62, chief of Canadian operations for Mack Truck Co. of Canada, died Sept. 10 in Hamilton, Canada.

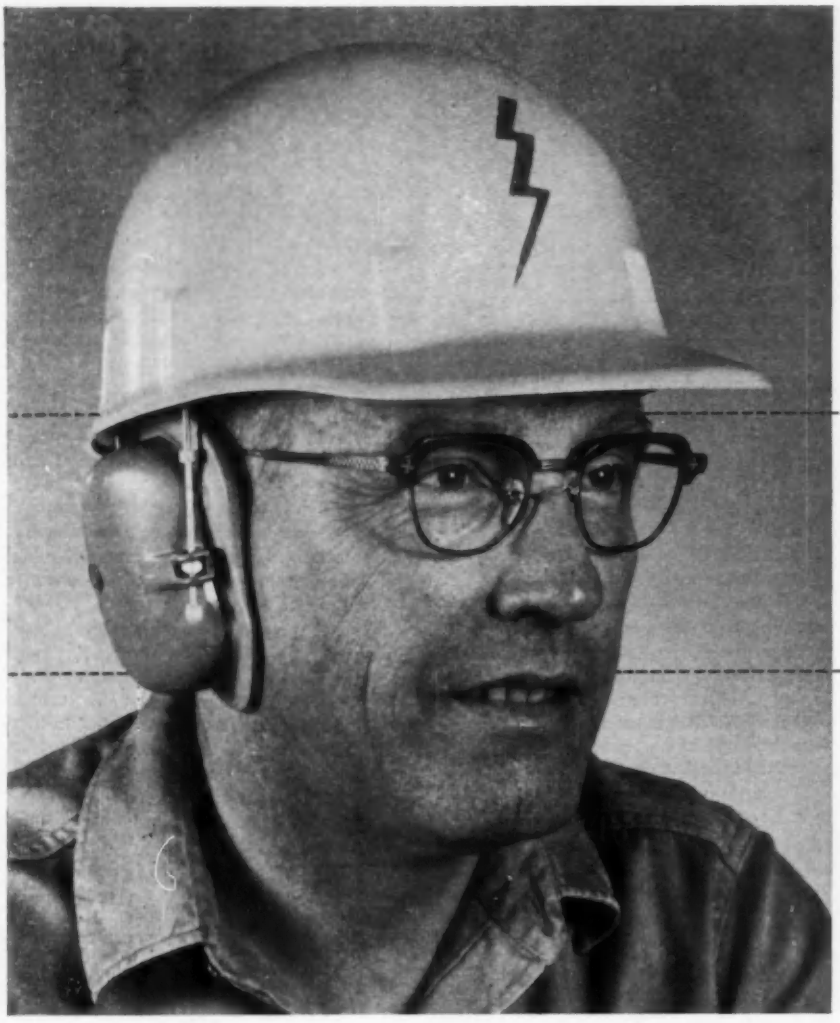
William L. Courage, 58, executive assistant to the American Motors Co. vice president of marketing and distribution, died Sept. 8 at Grosse Point Farms, Mich.

A. G. Cameron, 80, retired head of Goodyear International Corp., died Sept. 7 in Akron, O.

William F. O'Neil, 75, co-founder and board chairman of the General Tire and Rubber Co., died Sept. 4 in Akron, O.

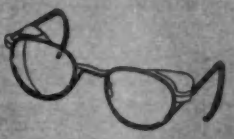
William S. Smith, 66, retired director of safety for the Ford Motor Co., died Sept. 3 in Detroit.

Dr. Harry K. Ihrig, 62, vice president in charge of research for Allis-Chalmers Mfg. Co., died Aug. 22 in Milwaukee, Wis.

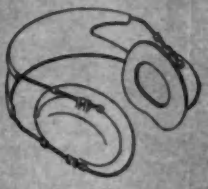




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Improving Production Systematically

an Editorial



DURING THE PAST YEAR, manufacturing engineers and production managers in a wide variety of automotive products manufacturing plants have been visited by AI editors. In a considerable number of plants, the plant managers have told the editors that one of the most important problems of manufacturing management is the systematic up-dating of technical information available for improvement of production processes, supplies and equipment. It was pointed out that much of the "technical" information sent to automotive industry engineers was so general, in its orientation, that it was not particularly useful in this specialized field.

THE REQUIREMENTS FOR ADEQUATE, specialized technical information are especially important in the automotive manufacturing field because of the great volume of mass production which is regularly planned and scheduled. Because of these requirements, manufacturing engineering research is more highly developed in the automotive industries than in many other fields of production. It is often necessary for an automotive plant to buy sample parts, tools, machines and supplies in order to find out adequate technical and engineering facts which can be used in production engineering, process engineering and manufacturing development plans.

IN RESPONSE TO THE REQUESTS of plant managers, therefore, AUTOMOTIVE INDUSTRIES Magazine will supply, in the December 15 issue, a new and unique technical editorial service. This consists of three parts; an issue of the magazine containing a 22 in. by 28 in. worksheet which is designed for use as a production improvement project planning record; an editorial description of the suggested method for using the project planning record; and a comprehensive directory of names and addresses of sources of product information. In addition, each plant manager, manufacturing manager, or other responsible top executive in charge of manufacturing in each of 6200 plants in the industries comprising the automotive manufacturing field, will receive through a supplementary mailing, an envelope containing valuable additional information.

THE ADDITIONAL INFORMATION will consist of technical data sheets (size 8½ x 11) furnished by advertisers. Each sheet will contain the following information: (1.) Correct technical description of each product, (2.) Itemized list of "Product Improvement Factors" in the form of specifications data oriented for automotive manufacturing plants, (3.) List of available additional technical literature, (4.) Comprehensive listing of engineering and technical services available from each manufacturer, such as re-research laboratories, quality control analysis, certifications, field application engineering staffs, etc. The data sheets also will list the manufacturers' branch office, distributors' names and addresses, and dealers or sales representatives.

THE COMBINATION OF THE COMPLETE project planning records, plus directory listing information in the December 15 issue, plus special mailed package of technical data sheets, should enable every plant manager or executive responsible for manufacturing to review and improve production operations on a more comprehensive basis than ever before. We have been told that this will be welcomed and used enthusiastically by AI readers because it will reduce to a minimum the time required to set up and follow-through on analysis of the improvement of each aspect of production in the plant.

CATEGORIES OF PRODUCTION OPERATIONS for which information will be supplied conform to typical classes as broken down by "Manufacturing Standards" departments in leading plants. The individual items of categories range from "Abrasives" and "Automation" to "Tools & Dies" and "Welding Equipment and Supplies." If you have not already planned a year-end review of manufacturing operations in your plant, the AI December 15 issue may be just what you need to set up your 1961 production improvement plans on a basis which will enable you to demonstrate, with a minimum of effort and a maximum of results, why the financial management of your company should approve your budget requests for new tools, supplies, equipment and materials for 1961 regular schedules.

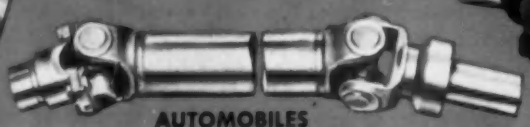
Horace W Barclay

Editor and Publisher

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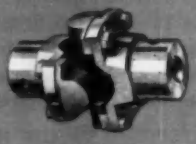


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FARM MACHINES



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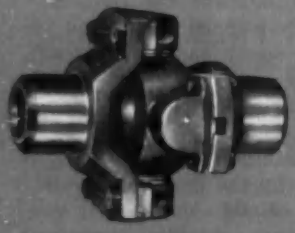
STEERING CONTROL



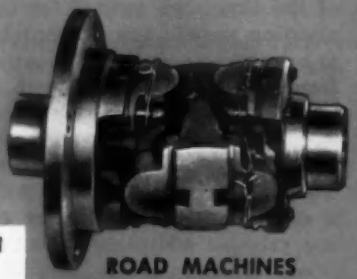
FARM TRACTORS



HELICOPTER



MINING MACHINERY



ROAD MACHINES

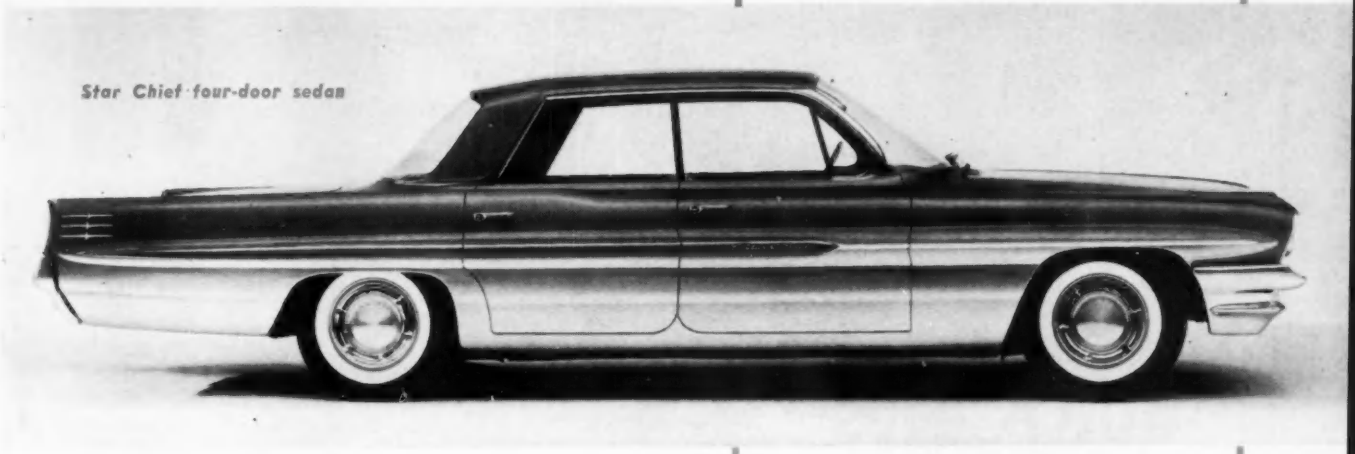
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1961 Pontiac

PONTIAC enters the 1961 model year with the familiar line-up of four series, in 15 body styles, emphasizing a distinctive and fresh styling theme. Catalina and Ventura series cars are mounted on a 119-in. wheelbase chassis; Star Chief and Bonneville on 123-in. wheelbase. However, the two-seat Safari in the Bonneville series has a 119-in. wheelbase, same as the other Safari models.



Star Chief four-door sedan

The basic Pontiac chassis embodies many changes and improvements. First of these is the new "perimeter" chassis frame, made in eight styles to suit the body types. The main feature is in the wide-spread side members supporting the outer edges of the passenger compartment of the body. These heavy gage side members permit lowering of the floor and increasing the seat height. Five cross-members serve to achieve frame rigidity, and also provide the mounting for the engine and chassis components.

The entire suspension system has been revised and features a different rear suspension. Main changes in the front suspension include: a stronger lower control arm, swept backward as before for anti-drive control; springs and shock absorbers selected for maximum softness of ride while retaining control.

The rear suspension has been completely redesigned through the adoption of a four-link system, resulting in improved lateral stability and better ride quality. The rear coil springs now are mounted directly over the rear axle bed, with a rubber shim between the spring and frame for insulation. The rear axle is held in alignment by two lower arms and two laterally-mounted upper arms, constituting the four-link system. The lower control arms, with rubber bushings at pivot points on the axle and frame bracket, are inclined inward to improve lateral stability. Shorter swing arms allow lowering of the rear body tunnel. Two separate upper control arms replace the "A" frame element used last year. Each arm reaches from the attachment at the axle housing to the frame bracket at the side rail. Rubber bushings are employed at each point of attachment.

LINE-UP OF SERIES AND BODY STYLES

CATALINA

4-dr. Sedan; Sport Sedan; Vista Sedan; Sport Coupe; Convertible Coupe; Safari 2-seat; Safari 3-seat

VENTURA

Vista Sedan; Sport Sedan

STAR CHIEF

4-dr. Sedan; Vista Sedan

BONNEVILLE

Vista Sedan; Sport Coupe; Convertible Coupe; Safari 2-seat

Although the basic 389-cu in. engine remains the same in specification detail, it embodies numerous improvements in design and construction. As a result, the 1961 versions are lighter in weight, more compact, more economical, smoother in action, and promise improved performance. Morover, the basic engine is midified in many ways to provide a wider selection of powerplant options.

(*Turn to page* 64, *please*)



New LeSabre four-door hardtop

BUICK adds Low-Priced Car to Line for 1961

WITH the revival of an old Buick nameplate—the Special—Buick has augmented its 1961 line with an entry in the low-priced field. The Special, shown below, with a newly styled unitized body, has a wheelbase of 112-in. In the higher priced series, LeSabre, shown above, and Invicta have 123-in. wheelbase; while the Electra and Electra 225 have a wheelbase of 126-in.

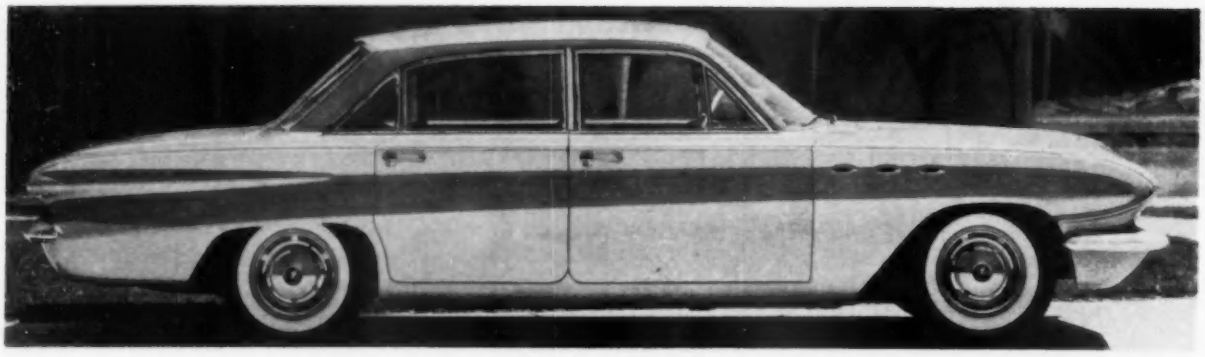
The Special has two body styles; sedan, and four-door station wagon in both standard and deluxe models.

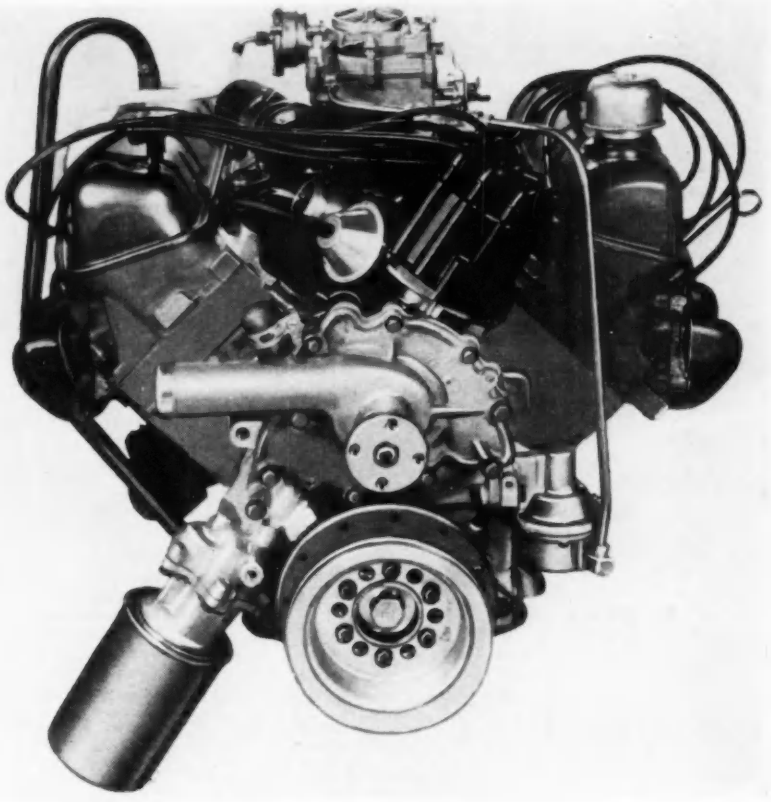
The BUICK Special

The Special is entirely new in every respect. Briefly summarizing at this point: it has a unitized body; it features the first generation, mass-produced, all-aluminum V-8 engine; it has a unique suspension and drive line; and a special version of the Buick automatic transmission.

Most prominent feature of this model is the new 215-cu in. all-aluminum engine. Weighing only 318 lb, this engine has the following aluminum parts: cylinder block, cylinder heads, intake manifold, timing chain cover, water pump cover, and other smaller details, all supplied by the Central Foundry Division. The cylinder block embodies cast iron liners, produced by centrifugal casting. The liners have circumferential grooves to provide a secure mechanical bond with the basic casting. Both the block and heads are produced by a

1961 Buick Special four-door sedan





Front view of the aluminum V-8 engine. Note the external mounting of the oil pump and the oil filter at the left of the illustration.

semi-permanent-mold technique.

The crankshaft is a casting of Armasteel, produced by the Central Foundry Division.

Spark plugs, which are centrally located, have extended electrodes with a skirt on the end of the threaded section. Pistons are of aluminum alloy, produced by permanent-mold casting, anodized. The concave piston dome forms part of the combustion chamber. Pistons are of full-skirt, double trans-slot design.

Another novelty is an oil pump which is an integral part of the timing chain cover, with gears housed in a cavity of the cover. The oil pump cover also serves as the base for the oil filter.

The intake manifold incorporates a water jacket surrounding the intake passages. This jacket also directs coolant under the manifold, over the top at the rear, and across the top to the water outlet.

With a bore of 3.5 in., stroke of 2.80 in., and a piston displacement of 215 cu in., the Special engine develops 155 hp at 4400 rpm, and torque of 220 lb ft at 2400 rpm. Compression ratio is 8.8 to 1.

Front suspension parts,, including the coil spring, ball joint, upper and lower suspension arms, shock absorbers, steering linkage hubs and brake drums are integrated as a unit tied into a front cross-member. The cross-member, in turn, is attached to the integral body frame with three rubber insulation mounts.

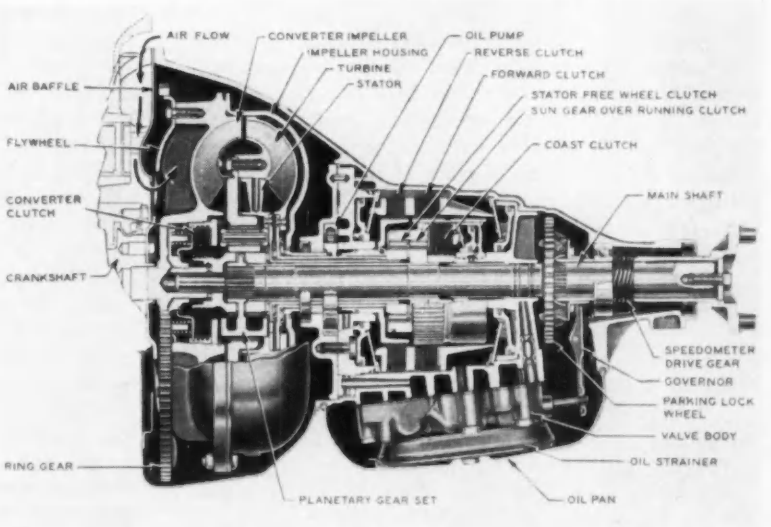
The rear coil spring suspension is coordinated with a rear axle of new design, having a large malleable-iron casting center section to which are attached the tubular arms. It has a tapered roller bearing mounting for both the pinion and differential. The differential, in general, is similar to that of the larger Buicks. The axle cover becomes a structural member when secured, being held by high-strength alloy bolts, assembled metal-to-metal with the casting.

The rear suspension system is of four-link type. The lower links reach from brackets on the tubular arms of the axle bed to an attachment at the body frame. The upper links are attached to brackets integral with the main axle casting, the other end being attached to the body frame.

The two-piece driveline is supported at the center by means of a cuff-type, low rate rubber mounting, attached to a structural cross-member of the body, the two sections being connected by a spline joint. The driveline is connected to the axle and transmission ends

(*Turn to page 68, please*)

Transverse section of the automatic transmission for the Special series





Fairlane 500 two-door sedan

Ford Offers New 390 Cu In. Engine

1961 FORD ENGINES
(All OHV type)

	223	292	352	390	390 (Hi-Perf.)
Type	6-cyl	V-8	V-8	V-8	V-8
Bore (in.)	3.62	3.75	4.00	4.05	
Stroke (in.)	3.60	3.30	3.50	3.78	
Displacement (cu in.)	223	292	352	390	
Compression Ratio	8.4	8.8	8.9	9.6	10.6
BHP (max.)	135@4000	175@4200	220@4400	300@4600	375@6000
Torque (lb ft) max.	200@2000	279@2200	338@2400	427@2800	427@3200
Carburetor	Single barrel	Two-barrel	Two-barrel	Four-barrel	

SIXTEEN models highlight the Ford line for 1961, all cars being about four-in. shorter and two-in. narrower than last year, without sacrifice in passenger seating. This has been accomplished through new sheet metal below the belt line with the greenhouse shortened on some models. Styling features a slim, flat roof line, full width aluminum grille, and round tail lights.

Series designations remain the same. However, two new models—Galaxie Club Victoria and the 6-passenger Country Squire station wagon—have been added, while the Fairlane Business Tudor Sedan has been dropped. In addition, the Starliner and Sunliner are placed in the Galaxie series.

While chassis features remain substantially the same, there are some significant changes and improvements. First of all is the principle of extended chassis lubrication. All chassis lubrication points are prelubricated at the factory with a special molybdenum-disulfide base material. In place of the regular grease fittings are small threaded plugs. The special lube is kept free from contamination by means of tough plastic seals and liners. The life of the first lubrication is said to be about 30,000 miles. If a fresh charge of lube seems necessary, the service station will remove the threaded plugs, install grease fittings, fill with a fresh charge of the special grease, then replace the threaded plugs.

A flexible coupling in the steering shaft has been introduced on both manual and power steering gear to reduce vibration and harshness.

For 1961, a six and three V-8's, including a new 390 cu in. engine, are available.

An emission reduction system will be available as an RPO item on all engines, but will be standard on the 390 cu in. engines. California assembly plants will install this device on cars produced for their marketing area.

1961 brakes have been equipped with a self-adjusting feature. The adjustment takes place at intervals, actuated by brake application during reverse braking. Brake design is basically the same as before, following the pattern of the double-sealed duo-servo mechanism.

Some changes have been incorporated in the Cruise-O-Matic transmission. It is about 25 lb lighter and is equipped with vacuum throttle valve control, for relaying the driver's accelerator pedal setting. Thus transmission shift quality and timing are built into the transmission and vacuum cam assembly independently of external influences or adjustments.

Design changes in body side structure increase rigidity and assure more effective door and window sealing. Hood width has been reduced by 11-in. with an improvement in the method of bonding inner and outer panels. Hood stability is improved by the introduction of linkage type hinges with a coil tension assist spring. The corresponding increase in fender width has permitted use of a one-piece upper apron and radiator support with additional support brackets at the fenders. This results in an improved structural tie across the front end.

Width of the luggage compartment opening is increased by about 10-in. and the spare tire laid flat on the floor pan at the kick-up area.

Another important change is a shift to tempered sheet glass for all side windows. ■



Falcon two-door sedan

Larger Engines Available as Optional Equipment on NEW FALCON

THE Ford Falcon enters the 1961 season with substantially the same package as during its first year but incorporating some noteworthy improvements. Perhaps the major item of interest is the availability of an optional 170-cu in. displacement version of the standard 144-cu in. engine. In keeping with the AMA agreement, all cars sold in California will be equipped with the sealed crankcase ventilation system—emission reduction control, as it is termed.

The same line-up of models is continued, namely, Tudor and Fordor sedans; and Tudor and Fordor station wagons.

So far as engines are concerned, Falcon will have some detail improvements. Both engines are fitted with a new air cleaner, said to promote quietness, more uniform air flow, and smoother operation at high speeds. A die-cast aluminum engine front cover replaces the stamped steel cover. An automatic choke is available for both engines as a dealer special order item.

The 170-cu in. engine, available with either manual or Fordomatic transmission, has a single venturi carburetor and single exhaust. The carburetor is of larger size and has a larger choke plate, being spring-loaded to afford improved cold engine performance.

Although running gear components remain about the same, they embody some refinements. Ride has been improved by a 10 per cent reduction in rear spring rate; smaller diameter front stabilizer bar and the adoption of pre-lubricated, threaded metal bushings in front suspension upper arm pivots.

The optional 170-cu in. engine requires some special running gear items. It takes a slightly larger muffler, and has a heavier rear axle with a larger ring gear. The manual three-speed transmission is basically the same as for the smaller engine but has coarse-pitch gearing. The Fordomatic is both air and water-cooled with converter modified for the higher torque.

The 170-cu in. engine differs from the smaller engine in a number of details as follows: larger throw crankshaft; different connecting rods; new slipper type pistons; new cylinder head with larger intake ports; larger intake valves; new distributor; different main bearings, water pump pulley, and water pump impeller; and a 15-in. fan. ■

FORD FALCON ENGINE SPECIFICATIONS

(6-Cyl. OVH Type)

	144 Std.	170 Optional
Bore (in.)	3.50	3.50
Stroke (in.)	2.50	2.94
Displacement (cu in.)	144.3	170
Compression Ratio	8.7	8.7
Bhp (max.)	85 @ 4200 rpm	101 @ 4400 rpm
Torque (lb ft) Max.	138 @ 2000 rpm	156 @ 2400 rpm
Fuel	Regular	Regular

Fuel Injection System For Small Planes

A new economical fuel injection system for small planes of up to 600 hp has been developed by the Products Div. of the Bendix Corp. The system is said to eliminate ice formation in an engine caused by the refrigerating action of vaporizing fuel.

1961 Oldsmobiles

Six-window Holiday sedan



New
F-85 Model Has All-Aluminum Engine

The Oldsmobile F-85

REACHING into the low-priced field, Oldsmobile offers for 1961 the F-85 car, mounted on 112-in. wheelbase, employing a fully unitized body structure, and available in two body styles: a four-door sedan and a station wagon, in both standard and deluxe versions.

The outstanding feature of the F-85 is an all-aluminum V-8 engine. This engine has a bore of 3.5 in., stroke of 2.8 in. and piston displacement of 215 cu in. Maximum horsepower is 155 at 4800 rpm; maximum torque is 210 lb ft at 2800 rpm.

Known at Oldsmobile as the "Rockette" engine, the new V-8 features cylinder blocks, heads, intake manifolds, clutch housing, and water pump made of 356 aluminum alloy. Cylinder blocks and heads are produced at the Central Foundry Division by a semi-permanent-mold technique. The block has cast iron, cast-in liners, centrifugally-cast, and bonded to the base metal by means of circumferential grooves along the entire length of each liner. Cast iron also is employed for valve guides, main bearing caps, and exhaust manifolds. The camshaft is made of a special hardenable chromium-nickel alloy cast iron. The crankshaft is an ArmaSteel casting supplied by the Central Foundry Division.

The Oldsmobile F-85



Many design features follow the pattern of the larger Oldsmobile engines. For example, the valve gear, cylinder heads, and combustion chamber geometry are similar, as are the aluminum alloy pistons which have chromium-plated top and oil rings. A newly developed deep, hat-type cover encases the air cleaner and carburetor and rests on the large-diameter seat provided for the purpose on the aluminum intake manifold. Carburetor bowl cooling is improved since all air entering the air cleaner is circulated about the carburetor

before entering the engine.

Conical valve springs are provided and hydraulic valve lifters are standard. The carburetor is of dual-throat design. Intake manifold is of water-warmed type, eliminating the heat valve.

Supplementing the standard synchromesh transmission is an entirely new HydraMatic transmission, offered as optional at extra cost. It has the same design and operational features as does the HydraMatic for the larger cars but is more compact and is 95 lb lighter. Both new HydraMatics have three speed ranges, with direct in third. A feature of the new drive is a three-element fluid coupling which is so designed as to provide a degree of torque multiplication in starting gear.

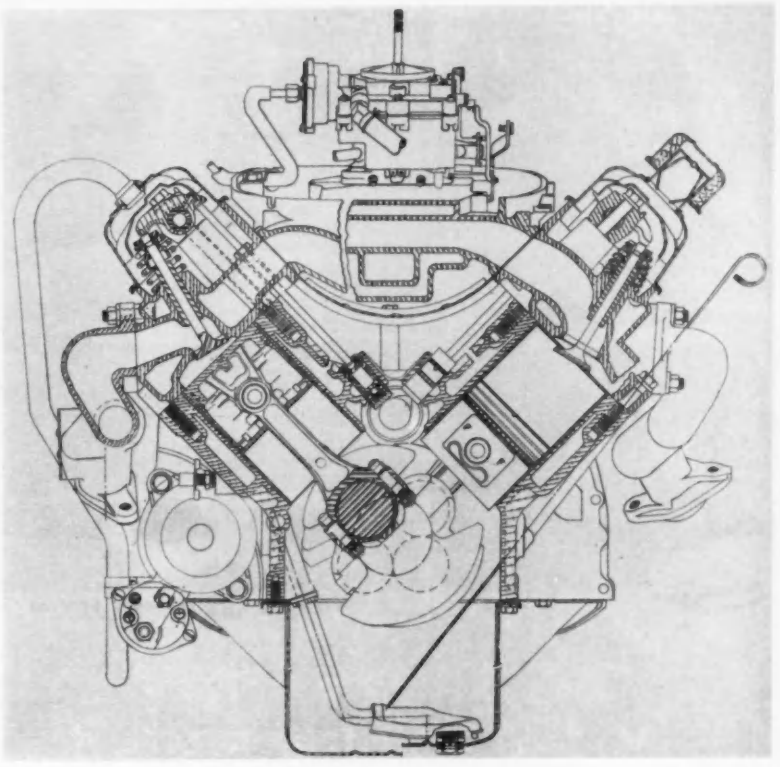
For high acceleration the drive provides a starting ratio of 3.64 to 1 which blends smoothly to a ratio of 3.03 to 1 before shifting into the second gear ratio of 1.58 to 1. Controls for this drive include a parking lock position.

A rear axle ratio of 3.23 to 1 is supplied with HydraMatic; 3.08 to 1 with synchromesh.

The entire front suspension, consisting of a new ball joint and anti-drive geometry suspension arms, is assembled as a unit and mounted on a separate cross-member. This cross-member, in turn is attached to the body frame side rails, the attachment being fully isolated by means of rubber mountings. In addition, the entire steering linkage also is mounted on the cross-member.

The rear suspension is designed to give proper stability and alignment with the rear mounted coil springs. It consists of two pairs of links or arms, one pair at the lower end, the other at the upper end. The lower links of the suspension are attached at the outer ends of the axle at one end, at the body frame at the other end. Their function is to transmit driving and brake forces as well as to control vertical stability. The upper links connect from the differential housing to the body frame to control lateral stability.

Standard tire size is 6.50 x 13-in. with an option of 7.00 x 13-in. Brake drums are 9.5-in. with 2-in. front linings; 1.75-in. rear linings.



Transverse section of the F-85 engine

Another feature is a two-piece propeller shaft with a center mounting of cushioned design, the rear driveshaft having a constant velocity Cardan universal joint.

Manual steering is standard with power steering available as an option. This is a smaller version of the Roto-Matic power steering gear, providing an overall steering ratio of 20.82 to 1. Manual steering is of recirculating ballnut type, with overall steering ratio of 26.18.

An air conditioning unit designed for this smaller car also is available.

F-85 models have an overall length of 188-in., overall width of 71.6-in. Tread is 56-in. front and rear. Curb weight of the sedan is 2695-lb; shipping weight, 2566 lb.

The Larger Oldsmobiles

EIGHTEEN models highlight the 1961 Oldsmobile line of full-sized cars. Bodies for the Dynamic 88 and Super 88 are entirely new, while a distinctively styled body has been developed for the 98.

Wheelbase remains the same: 123-in. for the 88's; 126-in. for the 98. Overall length is 212-in. for the 88's; 218-in. for the 98. Tread both front and rear is 61-in. Curb weight is respectively—4186-lb, 4225-lb, 4370-lb. Compared with last year the 88's are 5.6-in. shorter overall, while the length of the 98 is reduced by three inches, and although interior widths remain about the same, exterior width is 3.8-in. less. In all three series headroom has been substantially increased. The 98 has a longer rear deck and luggage compartment.

The "dog-leg" has been removed from the windshield corner. This, in combination with wider door openings both front and rear, makes entry and egress much easier.

The line-up of models is as follows: Dynamic 88—Holiday coupe; convertible; Holiday sedan (four-window, four-door hardtop); Celebrity 4-door sedan; two-door sedan; 4-door Fiesta station wagons, either two or three seat.

Super 88: Holiday coupe; convertible; Holiday sedan (4-window, 4-door hardtop); Celebrity 4-door

(*Turn to page* 81, *please*)



Plymouth Fury two-door hardtop

Plymouth for 1961

FOR 1961, Plymouth offers a range of 26 models plus a variety of engine and transmission combinations. Sedans are mounted on a wheelbase of 118-in.; station wagons on 122-in. wheelbase.

Eye appeal is greatly enhanced by a variety of sheet metal changes and entirely different ornamentation. Gone are the prominent fins so prevalent in recent years. Front fender lines sweep over the headlamps downward to the center of the aluminum grille. The hood and bumper are new.

Interiors are freshly styled and entirely new. A noteworthy feature is the right-angle magnetic drive for the speedometer found only on one other line in the Chrysler Corp.

The line-up of models is as follows: Savoy—two- and four-door sedans; Belvedere—two- and four-door sedans, and a two-door hardtop; Fury—four-door sedan, two- and four-door hardtops, convertible (available only as V-8). All of the above models are offered with either 6-cylinder or V-8 engine, except for the Fury convertible. Nine Suburban station wagons are available: two-door 6-passenger and four-door 6-passenger in the deluxe line (with either 6-cylinder or V-8 engines); four-door 6-passenger (with Six or V-8) and four-door 9-passenger (V-8 only) in the Custom line; 4-door 6-passenger and 9-passenger (V-8 only) in the Sport Suburban line.

Plymouth is replete with improved engines as well as new or improved mechanical features. Much of this information is contained in the feature article describing highlights of Chrysler Corp. cars (see AI, September 15, 1960).

The 225-cu in. Slant Six is standard equipment, the various V-8 engines are optional. The heavy-duty manual transmission is standard on cars equipped with 361- and 383-cu in. V-8's, on 318-cu in. V-8's with power Pak, and for all heavy duty taxis.

The manual three-speed transmission is standard equipment, except as noted above and is used with an axle ratio of 3.54 to 1 with the Six; 3.58 to 1 with V-8's; the heavy duty manual taking an axle ratio of 3.31 to 1. In addition, Plymouth offers a choice of PowerFlite with V-8's with axle ratio of 3.31 to 1; TorqueFlite with Sixes with ratio of 3.31 to 1; and TorqueFlite with V-8's with ratio of 2.93 to 1, except on the 361- and 383-cu in. V-8's where the ratio is 3.31 to 1. ■

Die Casters Expect Record Year in '61

Die casters expect a sharply increased use of die castings in 1961 automobiles, particularly the deluxe compact models, and believe the 1960 tonnage of die castings will surpass 1959 totals.

The American Die Casting Institute, at its annual meeting in Chicago, estimated the 1960 total of zinc die castings may reach 335,000 tons, or 10,000 tons above the 1959 figure. Aluminum castings, they added, may reach a new high of 387 million lb, or 12 million lb more than the 1959 total. Magnesium die castings are finding greater acceptance by the automotive industry, the institute reported, and new highs in magnesium production levels also are expected.

Speakers included Dr. Schrade F. Radtke, director of research, American Zinc Institute, and M. R. Caldwell, National Lead Co.



Cadillac Coupe de Ville

The 1961 Cadillacs

CADILLAC enters 1961 with 12 models in three Series: The Sixty, Sixty-Two, and Seventy-Five, completely restyled as to eye appeal and sheet metal. Wheelbase is 129.5-in. on the Sixty and Sixty-Two, 149.8-in. on the Seventy-Five. Overall length is 222-in. on all models, except the Seventy-Five which is 242.3-in.

The Fleetwood Sixty Special is even more distinctive this year, and has an exclusive upper structure not found on any of the other models. As a result it becomes the number one car in the line, permits dropping of the Eldorado Brougham.

A short-deck (seven-inches shorter) sedan model with an overall length of 215-in. will be made available later in the model year. The body will be the same as other six-window sedans but the rear deck will be shorter.

The line-up of models and series is as follows: *Fleetwood Sixty Special Sedan. Sixty-Two Series*—Coupe; Sedan, six-window; Sedan, four-window; Sedan, short-deck; Convertible; Coupe de Ville; Sedan DeVille in six-window and four-window bodies; Biarritz Convertible. *Seventy-Five*—eight-passenger Sedan and Limousine.

The change to new bodies and sheet metal makes the cars easier to get in and out of; head room and leg room are increased, and seating comfort enhanced with chair height seating. Entry and exit are improved by a rear door opening 7½-in. greater, by moving the center stub pillar forward, by narrowing the rocker shelf, and by increasing door opening heights.

The body tunnel is narrower and lower, stemming from a repositioning of the engine and transmission; while chassis and frame modifications permit lowering of the front floor section.

Some noteworthy changes and improvements have been made in mechanical units. Chief of these is an entirely new front suspension system, employing an upper control arm in combination with an adjustable strut for the lower suspension element. The latter provides control of fore and aft deflection of front wheels. This changes the geometry of the front suspension system, and makes it possible to move the front brake drums well into the air stream. This feature, combined with fins on the extended drums, makes it feasible to use a larger wheel cylinder.

Another significant mechanical feature is that the Cadillac chassis now is lubricated for life. Dual exhaust has been discarded in favor of a single exhaust system with a single muffler and separate resonator.

An anti-smog kit, comprising a closed crankcase ventilation attachment, is standard equipment on all cars consigned to California, optional on all others. Two new options are offered for the first time: a rear window defroster; and a non-slip differential.

A new hydraulic pump for power steering which provides greater pressure, reduces steering effort corresondingly, and has made it possible to use a smaller diameter (16-in.) steering wheel.

The engine is unchanged in basic design and specification data, and has the same rating as last year: 325 bhp @ 4800 rpm, 430-lb ft torque @ 3100 rpm. Compression ratio is 10.5 to 1. ■

New *Corvair* Has Larger Engine

CORVAIR, in the 1961 Chevrolet line, is continued basically unchanged in sheet metal and styling, except for exterior decorative treatment and seat and sidewall trim. In terms of models, however, the line has been expanded by the introduction of Lakewood station wagons; and Greenbrier sports wagons, the latter mounted on 95-in. wheelbase.

The line-up of models and series is as follows: *Standard* (500) and *Deluxe* (700) 4-dr, 6-pass. sedan; 2-dr, 5-pass. club coupe; 4-dr, 6-pass. Lakewood station wagon. *Monza* (900) 2-dr, 4-pass. sports coupe. *Greenbrier* 4-dr, 6-pass. sports wagon.

Although the basic mechanical features remain unchanged, numerous detail changes and improvements have been made in the engine, including an increase in displacement to 145 cu in.

Greenbrier sports wagons feature integral body-frame construction. Chassis components are of truck type with coil spring independent suspension both front and rear. They are equipped with the Turbo-Air, aircooled engine, mounted in the rear in conjunction with the Corvair transaxle.

Sports wagons come equipped with a second seat, mounted in the third seat location. This seat can be mounted in the second seat location, however, facing either forward or backward and a third seat added optionally.

Some detail changes have been made in the engine setup. First of all, hand operated chokes replace the single remote control automatic choke used last year. For improved cold weather operation, engine cooling air is recirculated through the engine compartment, shortening warm-up time and maintaining a warmer environment for the engine. This arrangement warms engine oil more rapidly and, in addition, the air for the induction system is preheated to reduce the possibility of venturi icing.

A new perimeter heating system which utilizes engine waste heat instead of consuming gasoline in a separate heater is offered for 1961. Nevertheless, the gasoline heater is available as dealer-installed accessory.

A wider choice of transmission options is offered this year with the introduction of an optional 4-speed manual-shift transmission, available with either engine version. It is about the same size as the standard three-speed transmission, and weighs only about six pounds more. Powerglide is available as an option as before.

Specifications for the 145 cu in. engine are as follows: bore, 3.4375 in.; stroke, 2.60 in.; compression ratio, 8 to 1; horsepower Turbo-Air, 80 at 4400 rpm; Super Turbo-Air, 98 at 4600 rpm. ■

Design Revealed For Auto Show Stamp

The design of the four-cent "Wheels of Freedom" commemorative postage stamp, to be placed on sale Oct. 15, at Detroit, in conjunction with opening of the National Automobile Show, has been revealed by Postmaster General Arthur E. Summerfield.

The design features three illustrations between the spokes of a symbolic steering wheel, a passenger car, truck and tractor. As a background, and linked by the central subject, are globes. Across the top are the words "WHEELS OF FREEDOM."

Corvair 700 sedan





1961 Lincoln Continental

New Lincoln Continentals Have Shorter Wheelbase

THE 1961 Lincoln Continental is a brilliantly styled new car with characteristically simple lines, mounted on 123-in. wheelbase (131-in. last year), with overall length of 212 in. It is offered in two body styles—four-door sedan and four-door convertible. On the convertible the soft top is automatically retractible into the luggage compartment. One of the features of both bodies is the use of curved side glass. Shipping weight is 4771-lb for the sedan, 5035-lb for the convertible. Tires are 9:00 x 14.

Improvement in the ride has been effected by unique front and rear suspension systems, employing a "silent-strut" at the front. This is a method of attaching the front suspension lower arm to a body cross member by means of an isolated strut containing a thick rubber bayonet-type bushing. Under road shock this bushing permits a slight rearward displacement of the wheel, with a consequent absorption of shock and noise. The front suspension also incorporates an anti-dive feature by inclination of the upper control arm.

More accurate front suspension adjustment stems from an improved caster-camber adjustment. No shims are employed; instead, the upper arm attachment has slotted holes to allow lateral movement on the upper arm shaft.

At the rear, the leaf springs are 60-in. long, 2½ in. wide, and are fitted with a 2-in. diameter rubber bushing at the front eye. Another unique feature is the attachment of rear springs to the rear axle by means of a sheet metal box structure lined with ½-in. thick butyl rubber. Called an "iso-clamp" mounting, it provides a fully isolated rear suspension free from metal-to-metal contact.

While the engine remains the same in basic dimensions: bore, 4.30 in.; stroke, 3.70 in.; displacement, 430 cu in.; it embodies a variety of design changes for better performance and reliability. Among these are: quieter single coil, constant pitch valve springs; a heavy duty distributor; a by-pass system in the carburetor for smoother idle; stepped diameter camshaft bearings to reduce the possibility of damage during assembly; and nylon teeth added to the camshaft drive sprocket.

Additional items include a tin overlay on the copper-lead main and connecting rod bearings to prevent scoring during break-in; double honing of bores, and a cast iron water pump pulley with a press fit on the shaft to assure positive alignment and quiet operation.

Piston design has been modified with the adoption of a full ring steel strut. The carburetor has a new air conditioning idle compensator. The latter consists of an electric solenoid activated by the air conditioning compressor when in operation. The solenoid opens a small passage to bleed additional air into the manifold to increase engine idle rpm.

The emission-reduction system for crankcase ventilation is standard on these cars.

"Roto-coil" exhaust valve rotators have been adopted, although the engine retains the Ford "free-turn" rotators on intake valves. Hydraulic valve lifters have chromium-plated plungers and a hardened steel outer body.

The exhaust system, consisting of mufflers, resonators, and laminated exhaust pipes is fully aluminized.

Generator and voltage regulator have been treated to major design advances. The 40-amp generator has improved brushes, brush holders, and bearings. It now provides

(Turn to page 78, please)



Impala Sport Sedan

Chevrolet Offers 20 Models for 1961

CHEVROLET'S offerings in the full-sized line for 1961 include 20 models with new body styling and sheet metal. Styling is distinctive, including a new roof treatment.

The 1961 line is available with the same engines as last year, the 6-cylinder engine series having the familiar 235.5 cu in. displacement OHV engine. The V-8 series offers the 283-cu in. engine as standard equipment; the 348-cu in. engine as optional equipment. Mechanical specifications and ratings of the three engines remain the same as last year.

Although the new models are mounted on 119-in. wheelbase as before, overall length is slightly shorter, and bodies are narrower and lower. With the new body the "dog leg" at the front has been eliminated. Station wagon tailgate openings are wider and higher, while loading height has been reduced.

The line-up of series and models, common to both the Six and V-8 engine lines, is as follows: *Biscayne*—2-dr, 6-pass. sedan; 4-dr, 6-pass. sedan; 2-dr, 3-pass. utility sedan. *Biscayne Fleetmaster:* 2-dr, 6-pass. sedan; 4-dr, 6-pass. sedan. *Bel Air:* 2-dr, 6-pass. sedan; 4-dr, 6-pass. sedan; 2-dr, 5-pass. sport coupe; 4-dr, 6-pass. sport sedan. *Impala:* 2-dr., 6-pass. sedan; 4-dr, 6-pass. sedan; 2-dr, 5-pass. sport coupe; 4-dr, 6-pass. sport sedan; 2-dr, 5-pass. convertible.

The station wagon line is comprised of the Brookwood, Parkwood, and Nomad series, all available in 4-dr, 6-pass. and 4-dr, 9-pass. models. ■

1961 CHEVROLET ENGINE POWER TEAMS

Engine (cu in.)	Bhp (max.)	Torque (lb ft) (max.)	Compression Ratio	Carburetor	Transmission	Axle Ratio
235.5 6-cyl.	135 @ 4000	217 @ 2000-2400	8.25	Single	3-speed	3.36 (std.)
					Station Wagon	3.55
					Overdrive	3.70
					Powerglide	3.36
283 V-8	170 @ 4200	275 @ 2200	8.5	2-bbl	3-speed	3.36 (std.)
					Overdrive	3.70
					Powerglide	3.08
					Turboglide	3.36
	230 @ 4800	300 @ 3000	9.5	4-bbl	(same)	(same)
348 V-8	250 @ 4400	355 @ 2800	9.5	4-bbl	3-speed	3.36 (std.)
					4-speed	3.08
					Turboglide	3.08
	305 @ 5200	355 @ 3400	9.5	4-bbl	HD Powerglide	3.55
					3-speed	3.36
					4-speed	3.36
	280 @ 4800	355 @ 3200	9.5	3 x 2-bbl	3-speed	3.36
					4-speed	3.36
					Turboglide	3.08
	340 @ 5800	362 @ 3600	11.25	4-bbl	3-speed	3.70 (std.)
					4-speed	3.70
	350 @ 6000	364 @ 3600	11.25	3 x 2-bbl	3-speed	3.70
					4-speed	3.70



1961 Corvette

The 1961 Corvette

ALTHOUGH the 1961 Corvette remains substantially unchanged in mechanical detail and styling, a number of changes give the car a different look. Rear body panels and rear end treatment have been changed to effect a new appearance. Similarly, the front end has been treated to a new grille, different name plates, and painted headlamp bezels.

Interior treatment is unchanged except for seat upholstery. However, the car now has sunshades, parking brake alarm, courtesy lights, and windshield washer as standard equipment.

With the change in rear body panels, the underbody has been revised and now has a narrower tunnel.

The chassis and power trains remain about the same, with the variety of options in engines, transmissions, and gear ratios as outlined in the table. The optional four-speed transmission now features an aluminum case for a weight saving of about 15 lb. ■

1961 CORVETTE ENGINE
(283-cu. in. OHV V-8)
Power Teams

	Bhp (max.)	Torque (lb. ft.) Max.	Compression Ratio	Carburetor	Transmission
Standard	230 @ 4800	300 @ 3000	9.5	4-bbl	3-Speed 4-Speed Powerglide
Optional	245 @ 5000	300 @ 3800	9.5	2 x 4-bbl	Same
Optional*	270 @ 6000	285 @ 4200	9.5	2 x 4-bbl	3-Speed 4-Speed
Optional	275 @ 5200	305 @ 4400	11.0	Fuel Injection	Same
Optional*	315 @ 6200	295 @ 47-5100	11.0	Same	Same

* Denotes use of special camshaft.

Compounds Available For Petroleum Tests

A set of 24 standard metal-organic compounds, suitable for spectrographic and chemical analysis of petroleum products, are available from the National Bureau of Standards.

These crystalline, oil-soluble samples are distributed with a certificate of analysis plus directions for preparing a solution of the substance. They can be employed as controls in the determination of metals in crankcase oils, gasolines and other petroleum products.

Armed Forces College Seeking Civilians

The Industrial College of the Armed Forces seeks qualified civilians in business, industry and the professions to enroll in its graduate-level correspondence course. The course has been set up by the Joint Chiefs of Staff for those unable to receive resident instruction at Fort Lesley J. McNair, Washington.

Qualified persons interested in the course are urged to apply to the Commandant, Industrial College of the Armed Forces, Washington 25, D. C., Attention: Correspondence Div.



The 1961 Imperial features new front-end styling

The New IMPERIALS

NINETEEN SIXTY-ONE IMPERIALS, featuring new front end appearance and restyled rear quarter treatment, are offered in three lines: Imperial Custom; Imperial Crown; Imperial LeBaron. The four-door Southampton hardtop is available in all lines; the two-door Southampton is offered in the Custom and Crown series only; and a convertible coupe is available in the Crown series. The line is equipped with the 413-cu in. V-8 as standard.

Unique styling feature this year is the free-standing mounting of headlamps. Each individually bezelled die-cast aluminum lamp is supported by a pedestal arm mounted on the gravel deflector.

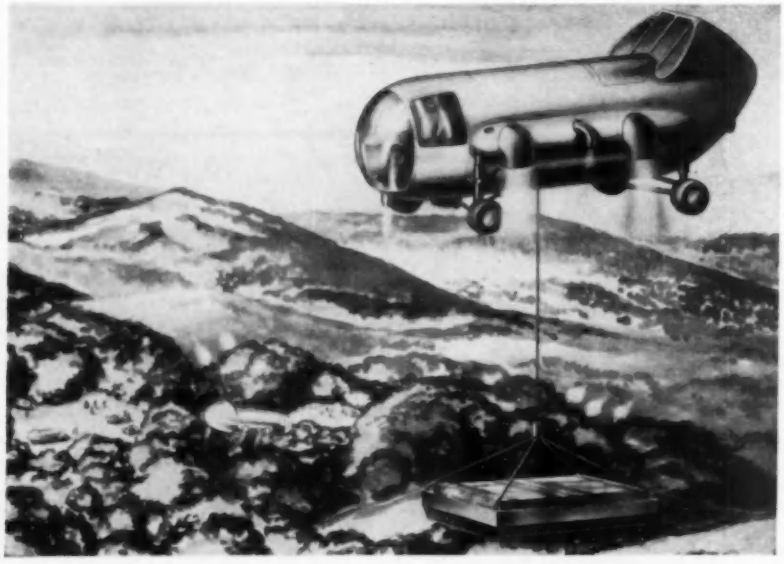
Tail lamp treatment too is distinctive. The suspended tail lamps are die-cast, chromium-plated pods with floating bezels, supported by arms extending from the extremities of the fins.

Details of major mechanical components were described in the round-up article published earlier (see AI, September 15, 1960).

The 413-cu in. engine with four-barrel carburetor remains basically unchanged except for details mentioned in the earlier article. The alternator for this engine has a rating of 35-amp; for cars with air conditioning, the alternator has a rating of 40-amp.

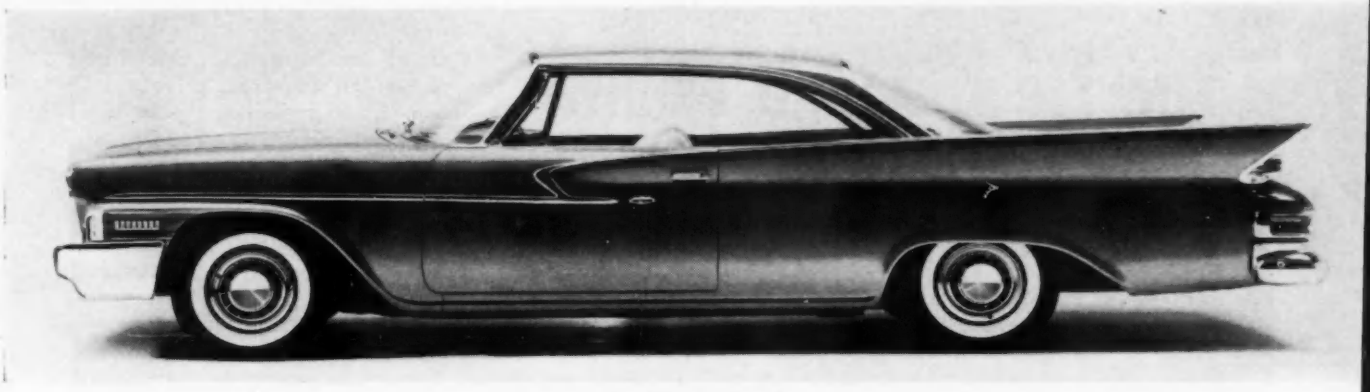
LeBaron features stainless steel appliques in the roof insert areas as standard trim.

Headlining for all models are of stipple-perforated grain vinyl. All-leather trim, standard on the Crown convertible, is available as special equipment in hardtops as well. ■



WINGLESS FLYING TRUCK

Intended for military and emergency rescue work, this flying truck is planned by Bristol Siddeley Engines Ltd. of England. Vehicle can be driven along highway or can fly. Power would be supplied by gas turbine engine. Lift would be obtained from down-thrusting turbojet engines. Engineers claim 20-ft model under study would fly at 230 mph for 190 mi.



Newport two-door hardtop

New Chrysler Models

THE Newport series, introduced as a line of full-sized Chrysler cars in a lower price range, highlight the offering of the Chrysler and Imperial Division. This series is powered by the 361-cu in. V-8 engine, with 9 to 1 compression ratio, and two-barrel carburetor, developing 265-bhp.

The Windsor uses the 383-cu in. V-8 with 10 to 1 compression ratio, two-barrel carburetor. New Yorker and Imperial have the 413-cu in. engine with 4-barrel carburetor, 10 to 1 compression ratio. Horsepower and torque figures for the 383- and 413-cu in. V-8's remain the same as last year.

The three-speed manual shift transmission with a floor-mounted straight shift stick is standard on Newport as well as Windsor series.

The complete line includes 15 models in four series as follows: Newport and New Yorker—four-door sedan; four-door hardtop; two-door hardtop; convertible coupe; four-door hardtop station wagon. Windsor series: four-door sedan; four-door hardtop; two-door hardtop. The 300G, scheduled for separate introduction, will be available in a convertible coupe, and a 2-door hardtop.

Newport and Windsor models are mounted on a wheelbase of 122-in.; New Yorker models are on 126-in. wheelbase.

Noticeable styling changes have been made. The hood is extra long while a new shape has been developed in the superstructure by a single-curvature windshield on all but convertible models. All exterior sheet metal is either new or reworked, except for rear doors and the two-door hardtop.

The simulated deck lid spare tire cover is available as an option on all models except station wagons.

The Chrysler closed crankcase ventilation system will be installed on all cars for sale in California.

Swivel seats, of manual type, are a factory-installed option offered only on Chrysler and Imperial models and specifically only on the following: Newport only on the convertible coupe; all models of the Imperial line when power-operated seats are specified. They are not available in the Windsor line, however.

Complete details of mechanical components were presented earlier (see AI, September 15, 1960) and will not be repeated here. ■

Military Truck Ends Reliability Test

Chrysler's floatable XM-410 military cargo truck has completed a 10,000-mi reliability run across 22 Western states, reports Robert L. Biggers, director of government and military vehicles sales. The truck passed through 120-degree heat in Death Valley, Calif., to 11,000 ft heights in Colorado.

He said the truck, an 8x8 2½ ton cargo vehicle, required only one non-scheduled stop and four quarts of added oil. Scheduled stops were made in Los Angeles at the 3000 and 6000 mi points for prescribed lubrication.

Chrysler Customers Still Prefer White

White continues to be the first choice of a majority of Chrysler Corp. customers.

More than 32 per cent of Valiant drivers have chosen white while 23.5 per cent of Plymouth owners have selected white. The DeSoto figure is 24 per cent. White Dodges are preferred by 27 per cent while 23 per cent desire white Chryslers and 24 per cent order white Imperials.

Second-choice color preferences run to light shades — azure blue, fawn brown, sky blue.

Although well down the line among Chrysler-built passenger cars, red is unusually popular among Valiant buyers. It ranks second and is closely followed by medium blue and black.

The New Dodge Polara

For 1961 Dodge offers just one series in the large Dodge car line—the Dodge Polara on 122-in. wheelbase. It is available in six models: four-door sedan; two-door hardtop; four-door hardtop; convertible; and two, four-door station wagons—one six-passenger, the other nine-passenger. All wagons have hardtop styling.

The bulk of chassis features and engine options were described earlier (see AI, September 15, 1960).

Cars destined for California delivery will be fitted with the closed crankcase ventilation system.

Special attention has been given to the choice of exterior trim materials. For example, on station wagons the rear bumper steps are of steel, chromium-plated. Stainless steel is employed in many areas, e.g., body side moldings, roof drip rail, four-door upper reveal, windshield reveal, door edge moldings, rear window reveal, lower deck and quarter panel moldings. Wheel covers too are of stainless steel, chromium-flashed.

Radiator grille and headlamp bezel are anodized aluminum stampings.

In addition, the following parts are of zinc die-castings, chromium-plated: tail lamp bezel, grille medallion, D-500 medallion, nameplates and Polara script, door handles, tail gate handle, station wagon tail gate assist handles, rear license plate frame, back-up lamp bezel, fender medallion. Brakes are 11 x 2½ in. both front and rear.

Among the optional factory-installed items are the following: standard and deluxe dual air conditioning; crankcase ventilating system; Sure-Grip differential; power brakes, steering, seats, and windows; radio and heater; padded instrument panel; Solex glass; automatic transmission.

Dealer-installed optional equipment includes: Auto-Pilot; automatic headlamp beam changer; rear window defroster; seat belts and padded sun visors. ■

DODGE POLARA MODELS FOR 1961

2-Door Hardtop
4-Door Hardtop
4-Door Sedan
Convertible
4-Door Hardtop Wagon (6 Passenger)
4-Door Hardtop Wagon (9 Passenger)

MAJOR SPECIFICATIONS—FOUR-DOOR SEDAN

WHEELBASE: 122"

TREAD, Front: 61.5"
Rear: 60.2"

OVERALL LENGTH: 212.4"
WIDTH: 78.7"
HEIGHT: 54.9" (loaded)

TURNING CIRCLE, Curb to Curb: 44.0 ft.

SEAT HEIGHT, Front: 11.4"
Rear: 13.2"

HEADROOM (seat occupied), Front: 37.8"
Rear: 38.1"

LEGROOM, Front: 45.1"
Rear: 42.4"

TRUNK CAPACITY: 32.8 cu ft.

TIRE SIZE, Standard: 8.00 x 14
Optional: 8.50 x 14

FUEL TANK CAPACITY: 20 gals.

ENGINES	BORE	STROKE	DISPLACEMENT	HORSEPOWER	TORQUE	COMPRESSION RATIO	FUEL
Polara, V-8	4.12	3.38	361 cu in.	265 @ 4400	380 @ 2400	9.0 to 1	Regular
Polara, D-500	4.25	3.38	383 cu in.	325 @ 4600	425 @ 2800	10.0 to 1	Premium
Ram Induction, V-8	4.25	3.38	383 cu in.	330 @ 4800	460 @ 2800	10.0 to 1	Premium



Dodge Polara four-door hardtop



Wider Selection of Valiant Models Available

VALIANT for 1961, mounted on 106.5-in. wheelbase as before, boasts many improvements in mechanical detail and in riding comfort as outlined in an earlier article (see AI, September 15, 1960). Continued in two Series—V-100 and V-200, Valiant offers a wider selection of models as follows: Four-door sedan and four-door, two-seat Suburban are available in both series; the two-door sedan is offered only in the V-100 series; while the two-door hardtop is available only in the V-200 series. The four-door, three-seat Suburban, offered last year, has been dropped. However, a three-seat, dealer-installed package is made available where additional seating is desired.

Although the sheet metal remains unchanged, eye appeal has been altered by the introduction of a new grille with dual headlamps as well as by a different treatment of exterior moldings. A stainless steel drip molding is standard on the V-200, door opening upper molding and rear-quarter molding being optional.

Interior treatment has been changed and an instrument panel safety cushion pad made available as an option on all models.

Air conditioning is available as a dealer-installed option. It is of recirculating type. With this option there is a special fan with greater capacity.

The three-speed synchromesh transmission is standard with rear axle ratio of 3.55. Two optional axle ratios are available—3.23 to 1, and 3.91 to 1. The three-speed automatic drive is optional with axle ratio of 3.23 to 1 standard, and 3.55 to 1 optional. With manual shift the standard clutch is 9⅛-in. diameter, a 10-in. clutch being optional. ■

CONDENSED SPECIFICATIONS—1961 VALIANT ENGINE

Type	6-cyl.; 30° inclined; in-line OHV
Bore, in.	3.40
Stroke, in.	3.125
Displacement, cu in.	170
Compression Ratio	8.2:1
Horsepower	101 at 4400
Torque	155 at 2400
Carburetor—Type	1 Barrel; Downdraft
—Venturi Diameter, in.	1.25
Valve Diameters, in.—Intake	1.62
—Exhaust	1.36
Bearing Diameter, in.—Main	2.75
—Connecting Rod	2.187



DeSoto two-door hardtop

DeSoto Making Two Models for 1961

CONTRARY to earlier rumors the DeSoto line will be in evidence in 1961, concentrating the line on two-door and four-door hardtop models. Stressing economy in a car in the medium-price field, DeSoto features one standard engine—361-cu in. displacement, with two-barrel carburetor, 9 to 1 compression ratio. This engine operates excellently on regular fuel.

Mounted on 122-in. wheelbase, the line boasts many noteworthy mechanical features which were described earlier (see AI, September 15, 1960).

Although the body and most sheet metal remain the same, there is a new roof on four-door hardtops. The compound curved windshield glass has given way to the more conventional glass of simpler curvature.

Overall length remains substantially the same.

The three-speed synchromesh transmission with 3.58 to 1 rear axle ratio is standard equipment; the three-speed TorqueFlite automatic is optional with axle ratio of 2.93 to 1. ■

75-HP Models Head '61 Johnson Outboards

Two 75-hp Sea-Horses are the top performers in Johnson Motors' 1961 line of outboard motors. Both have four cylinders, arranged in horizontal "V" fashion, with a total piston displacement of 89.5 cu in.

The Super Sea-Horse V-75A model is equipped with a brand new 20-amp alternator used in combination with silicon diode rectifiers and a transistorized voltage regulator. Other 1961 innovations are fixed high-speed carburetor jets, temperature warning lights, and additional sound silencing.

Further new features are sealed wire harness from motor to junction box, a safety interlock switch which permits starting in gear at part throttle only, and a newly-designed two-lever remote control.

The companion Super Sea-Horse V-75 likewise has all of the above new equipment except for the alternator. On this model the regular generator kit is available as an accessory.

Thermostatically-controlled recirculating cooling system, automatic choke, key switch starting, and fuel pump are standard on both models.

Johnson's 1961 line also includes 40-hp (in both electric-starting and manual types), 18-hp, 10-hp, 5½-hp, and 3-hp models.

Canadian VW To Expand Plant

Volkswagen Canada, Ltd. announces a 40 per cent expansion of facilities at its headquarters in Toronto.

The company has purchased a 64,000 sq. ft. plant bordering its existing property, whose two present buildings cover 156,000 sq. ft.

Name Is Changed

The Welded Steel Tube Institute, representing more than 20 manufacturers of welded steel tubing, has changed its name to the Formed Steel Institute.



Mercury Monterey

1961 MERCURY ENGINES

Brief Specifications

	223	292	352	390
Type	OHV Inline Six	OHV V-8	OHV V-8	OHV V-8
Bore (in.)	3.62	3.75	4.00	4.05
Stroke (in.)	3.6	3.3	3.5	3.784
Displacement (cu in.)	223	292	352	390
Compression Ratio	8.4	8.8	8.8	9.6
Bhp (max.)	135 @ 4000	175 @ 4200	220 @ 4400	300 @ 4600
Torque (lb ft) max.	196 @ 2000	279 @ 2200	336 @ 2400	427 @ 2800
Carburetor	Single	Two-barrel	Two-barrel	Four-barrel

New Mercury Has Shorter Wheelbase

ALTHOUGH last year's Mercury line had a new body and many distinctive mechanical features, even more sweeping changes have been incorporated in the line for 1961. Much of this stems from a reduction in wheelbase from 126-in. to the present 120-in., reducing overall length roughly by five inches. And with this has come a reduction in weight, approximately 200 lb on the average.

Reduction in wheelbase, coupled with a fresh styling approach, introduces entirely new bodies. The dogleg in the front compartment has been eliminated and the windshield made less prominent. Two different roof styles are found in sedan models; a fast sloping backlight on the "600" series; a flat type backlight on all other models.

The Cushion-Link suspension system is new this year. At the front the mechanism is located at the front pivot of the lower arm. Instead of the usual single pivot pin, the Mercury design has two pivot pins in a shackle arrangement. The upper pivot pin provides for normal vertical movement, while the lower pivot pin allows the arm and wheel to move rearward incident to horizontal forces from the road. A large elliptical rubber bushing surrounds the upper pin to absorb this horizontal movement, thus functioning as a shock absorber. Under all normal conditions the linkage holds the shackle in neutral center.

At the rear, the suspension features a newly designed tension shackle at the front anchor of the leaf spring. A tension shackle at the rear of the spring coupled with the front shackle permits horizontal movement of the rear wheels. The front shackle has a large volume of rubber to absorb shocks as well as to decrease the transmission of road noise. Control of amount of movement under shock loading is obtained by an extended arm mounted in rubber on the front shackle. The rear spring now has freedom of movement parallel with the resultant force due to shock loading. However, it is self-centering under the influence of the normal loading.

The 1961 line offers wide selection of transmissions and axle ratios. It includes the manual three-speed transmission; overdrive with manual transmission; two-speed Merc-O-Matic; three-speed Merc-O-Matic; and Multi-drive Merc-O-Matic. The latter unit contains a vacuum control assembly for transmission shift timing, instead of mechanical linkage between the throttle linkage and transmission. Mechanical linkage for kick-down maneuvers is retained, however.

Mercury cars will be pre-lubricated at the factory and will not require chassis lubrication for extended periods, possibly for as long as 30,000 miles, according to Mercury engineers.

Engine data are shown in the table herewith. ■



1961 Lark Regal four-door sedan

New Studebaker Larks

STUDEBAKER Larks appear in 1961 with some sheet metal changes designed to improve appearance materially. Biggest news is the OHV Six (see AI, September 15, 1960, page 60, for details).

The Lark line is available in two series — deluxe and Regal — in a choice of either the OHV Six or the 259-cu in. V-8. A distinguishing feature of the higher priced Regal models is the use of dual headlamps, the deluxe being continued with a single pair of headlamps, although dual headlamps are available at extra cost.

Besides the Lark models on the same wheelbase of 108.5 in., Studebaker offers a newcomer—a four-door sedan model on 113-in. wheelbase. This is available only as a V-8 model, with the 259-cu in. engine standard, the 289-cu in. Hawk engine optional.

The line-up of regular Lark models, available with a choice of either the OHV Six as standard equipment, or the 259-cu in. V-8 engine, is as follows: Two-door deluxe; four-door deluxe or Regal; Regal two-door hardtop; deluxe two-door station wagon; deluxe or Regal four-door station wagon; and Regal convertible.

The closed crankcase ventilation system is installed on all cars for California delivery, and is available at extra cost on special order.

The cars have a relatively flat floor and a new roof, with the entire level—roof and floor—lowered by one inch. Similarly, there is a lower cowl level, a new windshield, and new rear doors on sedans. The hood and rear deck, too, are new. In addition, the rear quarter panel is new on short wheelbase sedans.

An interesting feature of the hood is a torsion bar which also serves as a counterbalance, giving a wide hood opening for servicing. The hood remains securely in place in any desired position.

There is a larger rear window in sedans and hardtops. Bumpers are different and there is a new grille, a steel stamping, chromium-plated. Front headlamp bezels are of aluminum stampings.

One of the most important chassis changes is found at the front suspension. Here they have changed the front coil springs to a uniform rate spring, instead of the conical variable rate springs used last year. A heavy compression bumper takes care of variable rate operation.

Another item at the front is the use of a linkless type sway bar on OHV Six cars, the link type sway bar being continued on the cars equipped with V-8 engines.

Although some of the chassis details were mentioned in the earlier article (see AI, September 15, 1960) more complete information is given here. For example, the optional automatic transmission for the OHV Six has a one-way clutch reaction member added for the drive range. It also features a torque converter with higher stall speed.

The Saginaw recirculating ball type steering gear, of manual type, has been adopted as standard equipment. Overall steering ratio is 20 to 1, with 4¾ turns lock-to-lock.

For the first time the Lark offers power steering on the OHV Six, and continues power steering on the V-8-equipped cars. It is of linkage type, supplied by Bendix, and provides a reduction of some 30 per cent in parking effort on the V-8's.

The brake master cylinder now is mounted on the firewall, and suspended pedals have been adopted. A Bendix power brake is available as optional equipment.

Transmission options include the standard manual shift synchromesh transmission; optional overdrive; and optional automatic transmission. A wide choice of rear axle ratios is offered.

Studebaker is continuing the use of 15-in. wheels. Sixes are equipped with 15 x 6.00-in. tires; V-8's with 15 x 6.50-in. tires. ■

Chevrolet's Expanded Line of Trucks

FOR 1961, Chevrolet trucks continue most of the features brought out last year, with many refinements and styling changes. The line has been expanded by the addition of new models; and still more optional equipment items are offered.

New cab features for 1961 emphasize a lower and narrower floor tunnel on most light-duty models for improved foot and leg room with the 3-speed or Powerglide transmission.

Included in the 1961 line are three new 4-wheel drive models for light-duty, maximum traction application. The 127-in. wheelbase, ½-ton vehicles are available as cab-chassis, wide-box pickup and conventional box pickup models rated from 4900 to 5600 lb GVW.



One of the models in Chevrolet's 1961 line of trucks

All Chevrolet 4-wheel drive units for 1961 feature a new 10-in. diameter clutch, standard 3-speed transmission, and 7.10 x 15-in. tires on the ½-ton models.

Identifying styling refinements for all except tilt-cab models highlight a new frontal appearance, new group classification nameplates and new seat trim design.

A new, optional, temperature-controlled hydraulic fan drive is available for light-duty models with the V8 engine. The fan is disengaged unless it is actually required by radiator air temperature.

An optional crankcase ventilating system is offered. It will duct unburned hydrocarbons from the crankcase to the inlet manifold where they are funneled into the combustion chamber and burned with the fuel mixture.

Among modifications made late in the 1960 model run on certain models and now incorporated across the entire line are: increased capacity torsion bars for most medium and heavy-duty trucks for normal, severe and extra-severe service; new optional heavy-duty 12-leaf rear springs with ground capacity of 19,500 lb each for tandem axle models; redesigned 4-wheel drive lockout hubs to withstand greater torque.

Air brake compressor assemblies for the air-hydraulic and full-air brake systems have increased reservoir tank pressure. Heavy-duty vacuum power brakes on medium-duty models are revised, giving more pedal reserve and higher braking forces. ■



Dodge Dart two-door hardtop

Dodge Dart Has New Styling

EXTENSIVE sheet metal changes have given the 1961 Dodge Dart line a new look, despite the fact that basic body construction remains unchanged. The major changes are in the hood, fenders, rear deck, and rear quarter panels. These, coupled with new exterior trim combinations and altered front wheel openings, give the car an entirely new eye appeal.

The 118-in. wheelbase Dodge Dart is available in three series—Seneca, Pioneer and Phoenix—with a total of 24 body styles, the convertible being available only in the Phoenix series. Station wagons are found only in the Seneca and Pioneer series.

Major mechanical details, including the engine setup, were described in a previous article (see AI, September 15, 1960). The standard engine on the Dart Six is the 225-cu in. Slant Six. On the Dart V-8, the standard engine is the 318-cu in. V-8 with two-barrel carburetor, and an option of the same engine with a four-barrel carburetor. Both engines operate on regular fuel. Another option is the 361-cu in. V-8 with four-barrel carburetor, 9 to 1 compression ratio, operating on regular fuel. Besides this, the Dart also offers the 383-cu in. ram-induction engine.

The brake system is 11 x 2-in. standard both front and rear.

A wide range of optional equipment, some factory-installed, others dealer-installed, is available. Among the factory-installed items are: air conditioning, closed crankcase ventilation system, Sure-Grip differential, power brakes, power steering, heater and defroster, radio, Solex tinted glass, automatic transmission, windshield washer. Among dealer-installed items are: Auto-Pilot, automatic, beam changer, seat belts, padded sun visors, etc. ■

1961 Dodge Lancer Makes Debut



Dodge Lancer four-door sedan

TWO Slant Six engines, 170 cu in. and 225 cu in. are offered in Chrysler Corp.'s newest compact. The Lancer has a unitized body, 106.5-in. wheelbase and the four-door sedan is 188.8 in. in length. Both engines have compression ratio of 8.2 to 1. The 170 cu in. engine produces 101 hp at 4400 rpm. Seven body styles are available in two series.

Optional equipment includes air conditioning, power brakes and power steering; automatic transmission; heater and radio; and flushtype instrument panel with safety padding. ■

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News of the MACHINERY INDUSTRIES

Program at the Annual Meeting of the American Machine Tool Distributors' Association Included Addresses by NAM President and Chief of Ordnance, Department of the Army

By Charles A. Weinert

Leading Speakers at Distributors' Meeting

Constantly up-dated machine tools and methods are essential for progress in American industry and in the defense effort. This was the theme at the 36th Annual Meeting of the American Machine Tool Distributors' Association.

Guest speakers were Rudolph Bannow, president of the National Association of Manufacturers, and Lt. Gen. J. H. Hinrichs, chief of ordnance, Department of the Army. J. Russell Clark, AMTDA president, also gave an important message.

Held last month in Chicago, the meeting was attended by close to 250 Association members and their guests, including machine tool builder representatives.

Industrial Reform

Mr. Bannow, NAM president and also president of Bridgeport Machines, Inc., emphasized the importance of "reform" in America's industrial practices. He pointed out that American industry faces competition with facilities abroad that are tooled up with the latest equipment, including our best machines. Added to this is a wide disparity of wages in favor of foreign producers.

He said, "we face a competitive problem that challenges our industry to design the very best equipment and create the most modern methods. And what is most important of all, we have to develop knowledge and understanding amongst our work force of this problem so that new equipment and methods are utilized to their full potential."

Mr. Bannow also stated there is a need for revision of our "antiquated" laws on depreciation of equipment. That manufacturers abroad depreciate their equipment in five years, while we retain rules calling for periods up to 20 years.

Only in these ways, he declared, can we hold our own in a world where sharp competition is developing rapidly. Let us move forward by taking the brakes off the job-maker and freeing the creative spirit, he said in conclusion.

Defense

General Hinrichs discussed the highly-important inter-relationship between machine tools and the Army's requirements.

He said that any contribution which the industry makes towards reduction of cost represents a "positive contribution" to the Nation's defense. He expressed doubt whether this kind of result can be expected from "yesterday's tooling."

Numerical control programming, he noted, was a "most encouraging" development among the many new approaches for added versatility of production and cost savings.

Prosperous Era

J. Russell Clark in his talk rephrased the Exposition theme "Modern Machine Tools = Production Efficiency"—to "More Modern Tools in use will mean a Prosperous Era." He suggested two steps by which the machine tool industry might help "put these terms into action."

In his opinion, the machine tool builders are ready to supply American industry with equipment that will provide added productivity—and at prices which are economically justifiable. But he raised the question whether the industry is adequately prepared to sell the new technologies that have been developed. Along these lines, he advised that AMTDA, during the past year, had organized and held training programs on numerical control.

Mr. Clark, as his second point, said the machine tool industry must convince management of the need for regular investment in equipment as a means of giving greater economic value per customer dollar. That it is only in this manner that America can progress and "stay in business." Further, that Government has a major role in encouraging investment in modern competitive facilities.

New Officers

Since this was AMTDA's Annual Meeting, new officers for the ensuing Association year were elected. New **President** is George E. Merryweather, president of Merryweather-Strasmann Machinery Corp. Other new officers are: **Vice-President**—I. B. Rabel, president of Star Machinery Co.; **2nd Vice-President**—C. Denson Day, vice-president of Machinery Associates, Inc.; and **Secretary-Treasurer**—Wm. L. Walker, president of Walker Machinery Co.

AUTOMOTIVE INDUSTRIES
Keeps You Informed

METALS

Steel Operating Rate is Low and Size of Incoming Orders Is Disappointing, Although Their Number Is Increasing

by William F. Boericke

Steel Disappoints

Some steel executives now profess that the long slump in the operating rate must be ascribed to something more than an inventory correction. It appears to indicate a real business recession. The expected post Labor Day upturn hasn't materialized to any marked extent. Sights are lowered for fourth quarter business. A seasonal climb is now expected to be only moderate. Strength is missing in the market, and the size of incoming orders is disappointing, although the number shows an increase.

A price hike for steel just doesn't seem possible. The low operating rate, lack of consumer demand, intense domestic competition for any available business as well as low priced imports from abroad, all fail to provide a good background for raising steel prices. Add to this the hard hitting efforts that other materials are making to break into steel's traditional markets and the chance for a price increase must be consigned to 1961, if it can be envisioned even then.

Operating Rate Remains Low

By mid-September the steel production rate was no better than the pre-holiday pace. There was only sluggish buying by the oil and gas companies. Warehouse business was slow. The railroads were unhappy over strikes and lower car loadings than anticipated. Most steel backlogs had been wiped out, and the volume of new orders was as low as in the recession years of 1954 and 1958. Nevertheless, steel producers believe that their customers are using steel faster than they are buying it. If this is true, buying for prompt shipment can't be put off much longer. There has been some improvement in the call for cold rolled sheet, and galvanized sheets are still wanted. But tin plate has been a disappointment and the decline in demand has been more than seasonal.

Stainless Steel Price Shaded

There has been some shading in the prices for stainless steel, yet some producers scent a better demand. Some indication of this is seen in a modest increase in the price of chrome alloy after months of severe price cutting.

Prices of steel scrap have fallen $1.25 to $2.25 a ton from quotes in August. This decline came after several months of relative stability. With steel production at a low ebb there is no important mill buying.

Aluminum Output Ahead of Shipments

There has been little change in the aluminum situation during the past month. Consumption and demand have lagged behind output of primary metal by over 10 per cent. As a result, plant inventories of the industry at the beginning of August amounted to an estimated 204,000 tons, about 10,000 tons more than the highest level reported in the recession period of 1957-8.

The Diecasting Institute forecasts a 6000-ton gain in shipments of aluminum die castings in 1960 which would establish a new high of 193,500 tons. This compares with 335,000 tons of zinc die castings. But on a volume basis obviously aluminum is much ahead of zinc.

August Copper Figures Encouraging

The August figures of the Copper Institute were encouraging. U. S. Mine production declined during the month, probably due to vacations. Deliveries to fabricators were 25 per cent higher, showing a good recovery from July. Abroad, mine production was at a new high, but so were deliveries to foreign fabricators, convincing evidence that European demand is still strong.

Price Reduction Possible

While the smelters were still holding to their 33-cent price in mid-September, it appears likely they will reduce it in the near future, barring a long strike in Chile or unforeseen developments in Katanga. Number 2 copper scrap is selling at 25 cents a pound. It costs about 5½ cents a pound to convert it to refined copper deliverable 90 days hence. This means a total cost of 30½ cents, or a spread of 2½ cents under the 33-cent price, and so large a differential has not lasted long. Or considered from another angle, with London selling copper at 29½ cents, the spread with New York is about 3½ cents, compared with a more normal 2½ cents.

Zinc Looks Better

Zinc looks stronger statistically. The August figures of the Zinc Institute were considerably better than anticipated. Production of slab was about 10,000 tons less than in July, reflecting the strike at New Jersey Zinc plants and the long-continued work stoppage at the Idaho mines. Domestic shipments were up 12,000 tons, and

(*Turn to page* 64, *please*)

DOW

Proving ground for

AUTOMOTIVE CHEMICALS

It starts with a phone call . . . or an exchange of ideas through the mail. Then two men meet and start working together. One is an automotive engineer, the other a development chemist in Dow's Automotive Chemicals Laboratories. Their common interest is an advanced automotive design feature—one in which an equally advanced product of automotive chemistry will play an important role. In the area of cooling systems, for example, several new developments loom on the horizon . . .

EBULLIENT COOLING PROMISES CLOSED SYSTEM, FEWER WORKING PARTS

Originally proposed for vehicle use back in the 1920's, the principle of ebullient cooling was tempting; but a workable system was stymied for reasons which today are obsolete, such as the lack of an efficient coolant. Today, automotive engineers and Dow research chemists with new coolants are taking a closer look.

Ebullient, or "vapor phase" cooling is based on the principle of cooling by boiling. Highly simplified, the liquid coolant in the engine block is "boiled out" and passed to the radiator as a vapor. There it is condensed to a liquid and returned to the engine. Thus, heat is absorbed by vaporization, rather than by the sensible heat of the coolant. Ebullient cooling eliminates the thermostats and the water pumps of the conventional system, and most important of all, it may be a giant step toward the goal of all cooling system engineers —a sealed cooling system!

Ebullient vs. Conventional

At Dow's Automotive Chemicals Laboratories, preliminary tests have been conducted on a passenger automobile matching an ebullient cooling system

Recording temperatures of engine parts in ebullient cooling research.



and a conventional system. The heat transfer coefficients in the valve and cylinder wall areas for the ebullient system were found to be two to three times higher than for the conventional cooling system!

Automotive cooling systems have always been a subject of intense study by Dow's automotive development staff. Dow is a basic producer of ethylene glycol coolants, and through the years Dow corrosion engineers screened many corrosion inhibitor combinations for one that could be used in all sections of the country. Since the main offenders in a cooling system are water impurities and their variants, it was decided to formulate a totally compounded fluid to eliminate the need to add water to the radiator. Thus, after a series of exhaustive performance tests, came DOWGARD*, the world's first year 'round cooling system fluid. A blend of a completely new combination of protective chemicals, and specially treated de-ionized water, DOWGARD gives superior protection to all cooling system metals – including aluminum! *Trademark

NaOH: Workhorse in new flake form

The announcement that Dow has introduced a greatly improved new flake form of caustic soda . . . offering higher Na_2O content, and virtual dustlessness



New ground caustic flake is virtually dustless.

has been welcome news to the automotive industry. In many automotive plants, fast-acting formulations containing Dow caustic soda serve as metal cleaners, paint strippers, and waste disposal aids. Quick, dependable supplies of Dow caustic soda are available in all six forms: 50% and 73% solutions, as well as solid, flake, ¼-inch flake, ground flake.



Testing polyurethane foam for dynamic flexing.

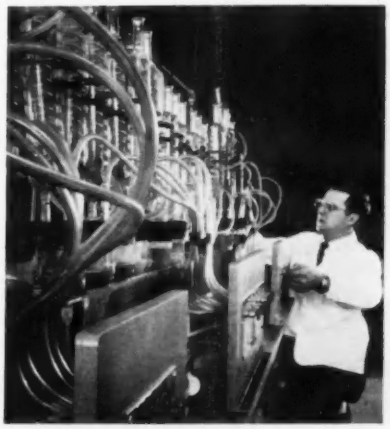
POLYGLYCOLS: from where you sit

In a driver's seat, resiliency, rigidity, and tensile strength are requirements for safe, comfortable driving. In the Dow Automotive Chemicals Laboratories, these are requirements for Voranol*, Dow resin-grade polyglycols used to make polyurethane foam seat cushions. Like the coolants, additives, and fluids that go under the hood, they were subjected to the same exhaustive research . . . are subject to the same high-purity requirements in Dow's automotive chemicals labs. And someday, you may see entire seat assemblies formed of this soft, yet tough material. Or in denser form, they may even be used to make pneumatic tires with a service life of several hundred thousand miles.

*Trademark

The many faces of amine

Another versatile "soldier" in Dow's array of automotive chemicals, the amines serve the automotive industry as ethanolamine soaps, combined with soluble oils, for lubricating and cooling cutting tools . . . triethanolamine has been used as an anti-corrosion additive in antifreeze solutions and hydraulic brake fluid formulations . . . automotive polishes are based on ethanolamine derivatives . . . and amines are also used as acid neutralizers in oil filters. In short, the amines are one of the vital links in the chain between the automotive industry and Dow automotive chemicals research.



Coolant solutions subjected to a battery of corrosion tests.

• INFORMATION, PLEASE: If you'd like more information on the above activities, or any area of Dow's automotive research, please write us. A member of our technical staff will give your inquiry prompt attention. Write: THE DOW CHEMICAL COMPANY, Midland, Michigan, Chemicals Merchandising Department 401 T-10-1; or contact a Dow sales office near you.

See "The Dow Hour of Great Mysteries" on TV

THE DOW CHEMICAL COMPANY
Midland, Michigan

DOW

Circle 121 on Inquiry Card for more data

AIRBRIEFS

By R. RAYMOND KAY
PACIFIC COAST EDITOR

"A man in space before the year's end." That's the hope of Dr. T. Keith Glennan, administrator, National Space and Aeronautics Administration.

"We have consistently said that we will put a man into space, using a Redstone missile. We'll do it as soon as we are reasonably sure this can be done with safety to the man," Dr. Glennan says.

NASA plans 260 major space launchings in the next 10 years. This includes the three-man spacecraft Apollo. There'll also be a Mariner and Voyager. Both are spacecraft for planetary missions.

The aerospace industry believes that by 1967, a 50,000-lb vehicle will be launched.

Jet Engines for Helicopters

Many leaders in the aircraft industry believe that the future of the commercial helicopter is hitched to the jet engine.

They say turbine power offers many advantages over piston power.

Examples: (1) A 40 per cent increase in payload over a 100-mile range.

(2) Inspections and overhaul maintenance in a third of the time.

(3) More passenger capacity at less cost per passenger mile.

Today's largest piston helicopter carries 15 passengers at a cost of 20¢ per passenger mile. A turbine helicopter, it's claimed, will be able to transport at least 25 persons at half the cost.

Meanwhile, more and more helicopters are going into commercial service. Just three years ago, only 470 were in use. Today, there are over 700.

The helicopter is becoming a jack-of-all-trades. It places power-line poles. It carries tourists over the terrain of Pickett's charge at the Battle of Gettysburg.

Electronics for the Military

Old-line aircraft companies are getting deeper and deeper into electronics. Their prime customer is the military. So far this year, sales to the Pentagon haven't been up to expectations.

Some companies are going into the numerical controls field. They realize that they won't get very far trying to force machine tool customers into huge new investments. Many hope to come up with automatic systems for use on existing equipment.

Here's one untapped non-military market for electronic gear; automatic positioning—from cranes to machine tools. This goes for any field where precision is basic, or hand-labor is a big cost.

Better Cadmium Plating

Lockheed Aircraft chemists report they've refined a cadmium-plating process. It makes high strength steel stronger — and reduces airframe weight.

A. M. Folden, the company's California Div. director, says the process uses chemical additives to eliminate effects of strength-stealing hydrogen gas.

"Gas released by earlier methods of plating steel with anticorrosion permeated the metal," he explains. "While this isn't of concern with steels of lower strength, the permeation did deteriorate tensile properties of high-strength alloys." The Lockheed plating technique permits use of less steel at critical aircraft juncture points — with over-all weight saving.

Low Drag Boundary Layer Control

Northrop's Norair Div. has a $20 million contract for flight testing Low Drag Boundary Layer Control. It's a revolutionary technique. It increases the range and endurance of aircraft without upping gross weight.

Lt. Gen. B. A. Schriever, Air Research and Development commander, calls the technique a "real breakthrough." The Air Force was on a 10-year search for such a method.

Using LDBLC an aircraft that normally flies 4000 miles nonstop will carry an equal payload 7000 miles nonstop. And that's with no increase in fuel consumption, Northrop says.

Components for Space Vehicles

There's a big new market in the making for suppliers to second generation space vehicles. NASA says qualified companies will have an equal chance to compete for this business. Some $220 million is earmarked for it. And NASA expects to give out contracts for about 85 pct of it to industry.

Many Countries to Build Starfighters

Lockheed is in a huge $2 billion international venture. The company is going to license many countries to build its 1300-mph Starfighter.

Many U. S. producers of accessories and electronic gear are in the deal. Here's a partial list: Minneapolis Honeywell Regulator, International Telephone and Telegraph, North American Aviation, Perkin-Elmer, Garrett, Bendix, and Radio Corp. of America. ■



FIRST CHOICE FOR GREATER FRONT END STABILITY...

TIMKEN-DETROIT®
-world's most complete line of front axles!

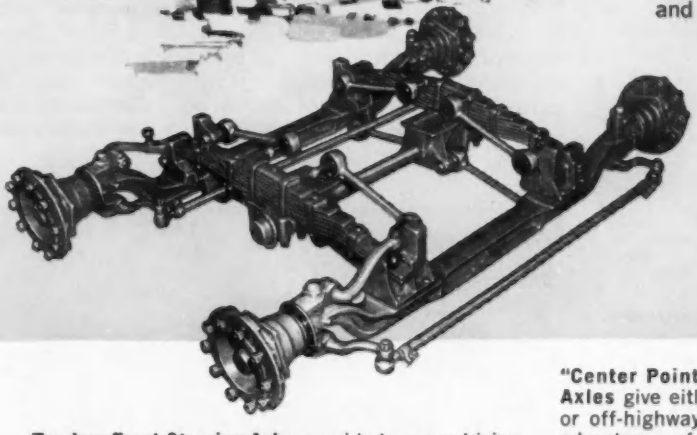


You get these three important advantages when your vehicles or equipment ride on Timken-Detroit F-900 Series Front Axles by Rockwell-Standard.

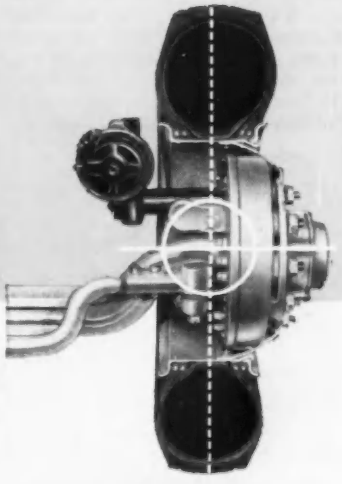
Whatever you operate – from light commercial vehicles to the heaviest off-highway equipment – there is an exact size and type of F-900 Series Front Axle to meet your need.

Superior design and construction features assure better performance under all conditions. These improved front axles reduce driver fatigue . . . make steering easier . . . hold the driving path better . . . help to prolong vehicle life.

In addition to the F-900 Series Axles, the following two new front axles are available from Rockwell-Standard. Each is the product of more than 50 years of field testing and laboratory research.



Tandem Front Steering Axles provide two non-driving front axles that increase maneuverability and double the front axle carrying capacity on special off-highway vehicles.



"Center Point" Steer Front Axles give either on-highway or off-highway vehicles the advantages of easy steering without the additional cost penalties of power assistance.

Another Product of... **ROCKWELL-STANDARD CORPORATION**

ROCKWELL R STANDARD

Transmission and Axle Division, Detroit 32, Michigan

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CITY ..... ZONE ..... STATE .....

Circle 122 on Inquiry Card for more data

Manufacturers' News

Packard Electric Expansion

Packard Electric Div. of General Motors Corp. plans a 225,000 sq ft building for manufacturing and storage facilities just north of the present plant in Warren, O. The new building will permit extensive rearrangement of the division's cable manufacturing facilities. It will house certain wiring harness operations as well as improved punch press and plating facilities.

Mortells Acquire Concern

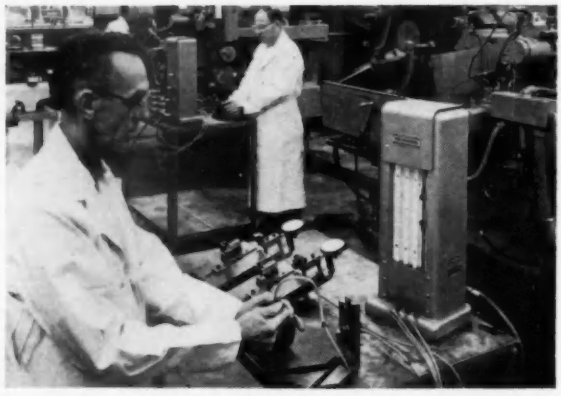
John L. Mortell and members of his family have acquired all common stock of the J. W. Mortell Co., Kankakee, Ill., supplier of technical coatings and sealers for the automotive and rail industries. Mr. Mortell was elected president and treasurer. Other officers are D. E. Mortell, vice president and general manager; J. W. Mortell, vice president-manufacturing; R. J. Mortell, vice president and eastern sales manager, and G. R. Peterman, secretary.

Borg-Warner Unit Sold

All-State Engineering Co., Inc., of Milwaukee, has acquired the industrial crane and hoist division of Borg-Warner Corp. Albert A. Saunders, All-State president, said the new division would be moved from Chicago to Milwaukee. A plant addition is under way and All-State plans to rent additional space to accommodate the new facilities.

Dorsey's European Pact

The Dorsey Corp. and its subsidiary, Dorsey Trailers, Inc., have entered into an agreement with Waggonfabrik Talbot and Etablissments Arbel, German and French concerns, to form a Swiss sales company, Dorsey Europe, to sell Dorsey trailers manufactured by Talbot and Arbel. Capital of the company will be owned equally by the three concerns.



Technician checks radius of bearing raceway in new Link-Belt Co. plant in Indianapolis. This is one of the 758 separate gauging operations required to produce a single spherical bearing. Tolerances are as close as 28 millionths of an in.

ECONOMY, DURABILITY AND DEPENDABILITY are outstanding characteristics of these sintered metal gears. Parts like these are the result of close cooperation between Delco Moraine and its customers from idea through design and development to production.



DELCO MORAINE

DEPENDABLY MADE *parts for automotive progress • Division of General Motors, Dayton, Ohio*

Meet the AI By-Liners



A brief biographical sketch of the editors and contributors to AI whose by-lines appear regularly

Introducing Cornelius J. Kelly

C. J. (Bud) KELLY, Assistant Editor, came to AUTOMOTIVE INDUSTRIES a year ago from one of the major aircraft manufacturers. He was employed by Vertol for a period of 7½ years, initially as a first-class machinist and then for five years, as a production planner.

Prior to that time, he served in the USAF for four years, being stationed at Lackland AFB (San Antonio), Connelly AFB and Dow AFB (Bangor, Me.). He graduated from the USAF machinist school, and worked in the public information office. While assigned to the information office, Bud was a reporter on the base paper and prepared news releases for the local newspapers. These releases concerned both social and official base activities.

During his spare time in the service, he took advantage of education programs offered by Baylor University and the University of Maine, and finished 2½ years of college training.

Bud, as he is known by his AI associates and friends in the industry, regularly prepares the copy for the New Product and New Production Equipment departments, Automation News Report, and Technical Literature section, and also handles the copy for special show issues.

1961 Pontiac

(*Continued from page* 33)

First of all, detail changes have been effected in the valve train. Valve rocker arm studs have been increased in diameter; rocker arm balls are larger, and the rocker arm ball retaining nuts are of larger diameter. Rocker arm balls, formerly made of steel, now are of sintered iron with larger bearing area. Valves and pushrods have been shortened and weigh less.

The cast iron cylinder heads are new, lighter in weight. Combustion chamber geometry, however, remains about the same; and the water-to-block cooling system is retained.

An aluminum timing chain cover replaces the cast iron cover used before. Although the same dual-chamber water pump design is retained, the water circulating system becomes simpler and neater because the cover is designed to butt against the manifold and thus eliminates external water plumbing.

Another noteworthy change is in the adoption of a one-piece propeller shaft, replacing the two-piece, three-joint driveline employed last year.

This year Pontiac offers two Hydra-Matic transmissions. One of these, designated as 61-10, is a new version of Hydra-Matic, lighter and more compact, as an accessory for Catalina and Ventura models. It has three forward speeds, and features an aluminum case. Moreover, the transmission main valve body is made as a single assembly instead of the three separate assemblies employed heretofore. A one-piece flywheel housing now is supplied.

Star Chief and Bonneville models have the optional four speed Hydra-Matic which is lighter through use of an aluminum case and a one-piece flywheel housing.

For 1961 the manual steering gear will have a flexible coupling between the gear box and mast similar to that used with power steering.

Improvement in muffler durability has been gained by using zinc-coated steel for muffler heads, bulkheads, inner and outer shells; aluminized steel is used for Star Chief and Bonneville tailpipes.

Finally, it may be noted that the closed crankcase ventilation system, for reducing smog effect, will be available as an option on all cars. ■

Forum to Discuss Air Conditioning

The Seventh Annual National Forum of Automotive Air Conditioning will be held in Dallas, Tex., Nov. 17 and 18.

The meeting is sponsored by the Texas Section, Society of Automotive Engineers, and the Automotive Air Conditioning Manufacturers Association.

Forum panels will discuss general design considerations, engine and assembly cooling, passenger compartment noise and vibration, drive components, compressors, electrical and control systems and design for compact and foreign cars.

AUTOMATION NEWS REPORT

AUTOMATIC CONTROLS

PRODUCTION—VEHICLES—AIRCRAFT

By C. J. Kelly
ASSISTANT EDITOR

NEW MACHINE TOOL CONTROL USES NO ELECTRONIC COMPONENTS

A DIVERSIFIED background in hydraulic control systems for missiles has aided *Moog Servocontrols, Incorporated*, in designing and developing a new concept in automation. This system is based upon pneumatic-hydraulic principles and totally discards the use of electronics. According to Moog, this unit will automate machine tools for less than $9000.00.

HOW THIS SYSTEM FUNCTIONS

Deriving its power from the machine tool to which this unit has been applied, Moog's control consists of a combination tape-reader and control console, compressed air storage compartment, and a hydraulically operated piston and cylinder unit beneath the machine table.

According to machining instructions, the tape is punched by a Flexowriter utilizing the Binary Coded Decimal System. It is then placed in the tape reader and the punched holes actuate air pressures which are directed upon a transducer in the form of a metal diaphragm. The diaphragm transfers the pressures into fluid power which acts upon a series of cylinder ports. Varying fluid pressures operate servo and power pistons which position the machine table on two axes for any point-to-point metalworking process such as drilling, boring, tapping, reaming, counterboring or spot facing.

The system controls all machine functions, including indexing the turret in any sequence, operating the coolant, blowing chips, etc.

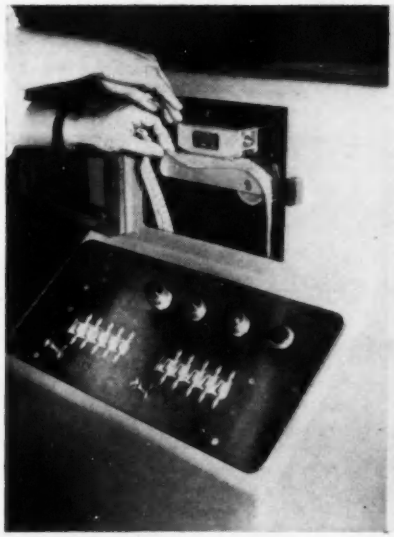
ACCURACY GUARANTEED

The guaranteed repeatability of the "Hydra-Point" control system is set at plus or minus 0.0003 in. Tolerance on table positioning is claimed to be plus or minus 0.0005 in.

The firm adds that, by eliminating the usual lead screw by direct hydraulic piston drive and through the "built-in" accuracy of cylinder ports which cannot wear, there are additional lifelong precision advantages.

Being one of the nation's leading producers of electro-hydraulic servo systems for missile control, Moog has also developed industrial control equipment such as automatic spar milling devices for aircraft manufacturers. Applying its hydraulic power concepts to numerical control, its new system represents the latest step in the expansion of the firm's industrial division. ■

SEQUENCES IN MOOG PNEUMATIC-HYDRAULIC AUTOMATION SYSTEM



A continuous tape, punched with machining instruction program is inserted into tape-reading console.



Blank part is placed on Burgmaster drill press table, prior to automatic machining.



Machinist watches as hydraulic pistons (rear and lower right) position table to correct location for drilling.

CINCINNATI

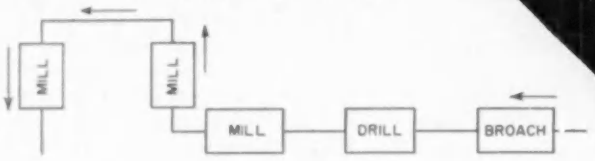
ADAPTABLE GIANT

Cincinnati 36-Station Transfer Line Automatically Machines

V-6 *and* **V-12** ENGINE BLOCKS



CINCINNATI 36-Station Transfer Line broaches, mills, drills and reams V-type engine blocks, all in one continuous operation. Production, 67 per 60 minute hour.



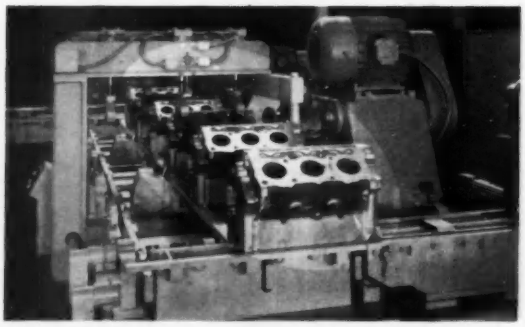
In this CINCINNATI special 36-station transfer line, the world's largest broaching machine is integrated with drilling and milling stations . . . for continuous, automatic machining of automotive engine blocks. Both V-6 and V-12 blocks, made in three different bore sizes, are accommodated with very little change-over. Cincinnati's Special Machine Division designed, built and assumed full responsibility for every detail of the line.

Twelve surfaces are machined on the broach, which has a 600 hp drive capable of developing a broaching force of 100 tons! Manufacturing holes then are drilled and reamed, and 10 surfaces milled, all in one continuous automatic operation. The line measures approximately 140 feet, and contains 30 motors rated at more than 1000 hp.

From the first broaching operation to the final interlock station, this giant production line is evidence of the capabilities of the Special Machine Division. Our Field Engineers will be glad to give you an analysis of what they can do for you. **Special Machine Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.**



BROACHING STATION. As blocks move through the line, the top, bank faces, pan rail, bearing pads, bearing locks and half bore are broached.



MILLING STATION. Pads are milled on the side of the block, and the front and rear ends are rough and finish milled.

CINCINNATI®

SPECIAL MACHINE DIVISION

SPECIAL MACHINES • COMPLETE PRODUCTION LINES

• VERTICAL AND HORIZONTAL BROACHING MACHINES

Circle 120 on Inquiry Card for more data

• • INDUSTRY STATISTICS • •

By Marcus Ainsworth
STATISTICAL EDITOR

WEEKLY U. S. MOTOR VEHICLE PRODUCTION

As reported by the Automobile Manufacturers Association

Vehicle Make	Weeks Ending Sept. 17	Weeks Ending Sept. 10	Year to Date 1960	Year to Date 1959
PASSENGER CAR PRODUCTION				
Total—American Motors Corp.	7,750	3,868	340,845	279,323
Chrysler	1,908	1,461	61,689	51,141
De Soto	225	152	17,035	34,502
Dodge	9,650	8,319	311,586	114,438
Imperial	593	456	10,443	13,691
Plymouth	5,095	3,792	182,620	313,834
Valiant	3,258	3,229	189,166	.....
Total—Chrysler Corp.	20,729	17,409	773,539	527,606
Comet	5,421	4,462	129,884	27,052
Falcon	11,953	8,519	362,449	2,388
Ford	14,748	11,482	684,828	1,085,632
Lincoln	.....	.....	13,194	19,076
Mercury	1,874	1,414	106,522	106,079
Total—Ford Motor Co.	33,996	25,877	1,298,987	1,242,229
Buick	3,495	954	188,454	169,308
Cadillac	933	42	110,913	107,997
Chevrolet	5,294	151	1,170,634	1,122,513
Corvair	2,463	4	173,116	21,238
Oldsmobile	4,830	1,454	263,973	288,355
Pontiac	4,212	1,285	313,576	312,580
Total—General Motors Corp.	21,227	3,890	2,220,666	2,021,991
Total—Studebaker-Packard Corp.	2,331	1,633	76,239	109,729
Checker Cab	145	118	5,207	2,839
Total—Passenger Cars	86,178	52,795	4,714,483	4,183,717
TRUCK AND BUS PRODUCTION				
Chevrolet	6,782	4,040	285,600	265,706
G. M. C.	1,268	545	79,724	62,902
Diamond T	30	10	2,061	4,345
Divco	80	64	2,936	2,676
Dodge and Fargo	1,359	827	52,256	56,750
Ford	6,085	3,760	258,954	244,844
F. W. D.	14	13	698	771
International	2,454	1,753	92,602	105,994
Mack	336	273	11,196	12,951
Studebaker	48	318	9,952	9,689
White	261	29	12,263	14,525
Willys	1,478	1,269	96,543	84,154
Other Trucks	85	75	3,215	2,707
Total—Trucks	20,300	12,976	908,020	868,014
Buses	75	70	2,910	1,793
Total—Motor Vehicles	106,553	65,841	5,625,413	5,053,524

NEW FOREIGN CAR REGISTRATIONS *

JULY

1960		1959	
Volkswagen	12,554	Volkswagen	10,388
Renault	6,006	Renault	8,494
Opel	2,357	English Ford	3,934
English Ford	2,241	Fiat	3,783
Triumph	1,901	Opel	3,486
Austin Healey	1,811	Simca	3,437
Fiat	1,642	Hillman	2,687
M. G.	1,299	Triumph	2,258
Mercedes Benz	1,265	Vauxhall	2,046
Simca	1,231	Austin Healey	1,842
All Others	11,230	All Others	14,184
Total	43,537	Total	56,539

SEVEN MONTHS

1960		1959	
Volkswagen	89,545	Volkswagen	64,952
Renault	44,880	Renault	47,177
Opel	17,997	English Ford	26,099
English Ford	17,508	Opel	23,069
Fiat	14,129	Fiat	22,344
Triumph	11,010	Simca	22,148
Austin Healey	10,832	Hillman	17,420
Simca	9,817	Triumph	13,691
M. G.	8,859	Vauxhall	13,423
Peugeot	8,396	Volvo	11,200
All Others	81,277	All Others	86,788
Total	314,250	Total	348,311

TRACTOR SHIPMENTS

WHEEL TYPE

Hp. Ratings	July	Seven Months
9-34 belt hp.	1,120	19,501
35-39 belt hp.	1,728	15,236
40-49 belt hp.	1,639	21,716
50-59 belt hp.	1,600	26,180
60 belt hp. and over	1,044	16,203
Total	7,131[1]	98,836[2]

TRACKLAYING TYPE

25-59 net engine hp.	292	4,456
60-89 net engine hp.	321	2,399
90-299 net engine hp.	117	1,092
Total	730[3]	7,947[4]

[1]—Valued at $14,300,000
[2]—Valued at $207,259,000
[3]—Valued at $18,878,000
[4]—Valued at $186,122,000

1960 NEW REGISTRATIONS *

Arranged in Descending Order According to the Seven Months, 1960 Totals

NEW CARS

Make	July 1960	June 1960	July 1959	Seven Months 1960	Seven Months 1959
Chevrolet	147,288	161,284	139,660	1,034,959	896,710
Ford	108,339	117,685	136,594	834,034	871,773
Plymouth	38,929	43,652	37,707	277,869	233,492
Rambler	39,291	41,158	36,762	258,523	213,602
Pontiac	32,950	35,288	36,635	240,861	237,696
Dodge	34,998	38,177	14,110	228,310	86,795
Oldsmobile	26,214	28,360	32,407	204,468	227,289
Buick	19,235	22,096	20,639	154,672	155,572
Mercury	11,050	13,018	13,610	92,752	90,572
Cadillac	10,759	11,966	11,736	87,247	87,679
Comet	14,245	17,583	.....	69,461	.....
Studebaker	8,837	9,608	12,475	67,850	81,046
Chrysler	6,073	6,927	6,045	47,162	38,018
De Soto	1,896	2,094	4,421	16,691	27,472
Lincoln	1,283	1,493	1,953	13,177	16,990
Imperial	1,133	1,230	1,390	9,424	10,466
Misc. Domestic	478	946	3,770	5,994	30,780
Foreign	43,537	43,309	56,539	314,250	348,311
Total—All Makes	546,535	595,864	568,453	3,957,704	3,654,263

NEW TRUCKS

Make	July 1960	June 1960	July 1959	Seven Months 1960	Seven Months 1959
Chevrolet	26,149	29,513	31,309	193,362	199,096
Ford	23,293	24,799	26,222	170,285	163,368
International	9,646	10,145	10,522	67,644	59,862
G. M. C.	7,565	7,726	6,730	48,666	41,913
Dodge	3,762	3,449	4,937	25,777	32,616
Willys Truck	1,426	1,591	1,558	10,976	10,198
White	1,474	1,384	1,252	9,468	9,005
Mack	966	991	1,204	6,949	8,325
Willys Jeep	799	954	789	5,778	5,024
Studebaker	629	650	619	3,016	3,795
Diamond T	216	246	336	1,639	1,611
Brockway	90	99	80	699	633
All Others	3,659	3,986	3,552	26,868	23,916
Total—All Makes	79,674	85,535	89,110	571,127	559,362

* Compiled from official state records. Data property of R. L. Polk & Co. May not be copied, sold or reprinted without Polk permission.

America's First cO-Mpact Cylinder





INTERNAL KEY
TIE-RODLESS-TYPE SERIES 101A

Air 150 psi—Hydraulic up to 1500 psi
Fits where others won't
Meets JIC Standards, Bulletin 101A

This original space-saving cylinder is the most compact, streamlined and versatile cylinder available. It requires one-third less installation space and has a greater ratio of power to its size and weight than tie-rod-type cylinders with the same bore and psi rating. In addition, the ports can be rotated independently to any convenient location. It is easier to service. And by using a majority of standard parts and one or two semi-standard parts, this component gives you the advantage of special cylinders that do a better job at a nominal cost.

This compact unit has the lowest coefficient of friction. It is designed right to seal right . . . to make full-power starts on thrust and return strokes . . . to maintain perfect rod alignment . . . and cushion piston shocks. End plugs are tapped for universal mounting.

Coupon below brings Bulletin desired.

Bulletin 101A for Internal Key Tie-Rodless type Air and Hydraulic Cylinders featured above.

Bulletin 105A—Improved Tie-Rod (Heavy Duty) Cylinders Hydraulic 2000 psi; 3000 psi non-shock.

Bulletin 107—Automation (Heavy Duty) Air Cylinder for 200 psi operation.

Bulletin 108—Automation (Heavy Duty) Hydraulic Cylinder—for 1000 psi operation.

All O-M Cylinders are available in 1½" to 8" bores with standard or heavy-duty rods. Complete line of mounts and interchangeable parts. Immediate delivery on most sizes. **MAIL COUPON TODAY.**



ORTMAN-MILLER MACHINE COMPANY
17 143rd Street, Hammond, Indiana

Send Bulletins
☐ Have representative call ☐ 101A ☐ 107 ☐ 105A ☐ 108

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Circle 125 on Inquiry Card for more data

Buick Adds Low-Priced Car to Line for 1961

(Continued from page 35)

by a needle-bearing universal joint of separable yoke design. The center joint is a double Cardan constant velocity joint, composed of two single joints mounted back-to-back and piloted by a ball-socket member.

Brakes are of duo-servo design, 9½-in. in diameter, two inches wide at the front, 1¾-in. wide at the rear. Brake drums are made of pearlitic cast grey iron.

The optional automatic drive is a new version of the familiar Buick auotmatic transmission. It is of aircooled, geared turbine, torque converter type. The torque converter os of three-element design, with a torque multiplication of 2.4 to 1. The drive is unique in that it has an automatic clutching device permitting engine torque to follow two distinct paths through the converter—36.6 per cent mechanical, 63.4 hydraulic after upshift.

The planetary gear set, located within the converter, takes care of all speed maneuvers. In addition, there are four friction clutches—one in the converter; and three—reverse, forward, and coast—in the case. Overrunning clutches for both stator and turbine sun gear are located in the case.

Torque flow in this drive is accomplished at a pre-determined speed when the converter clutch engages. The front pump is actually the heart of the hydraulic system, the outer periphery of the plungers acting like a vane pump. There is also a suction port to the inside of the rotor which picks up oil. As the rotor turns, the plungers are forced in so they squeeze out oil, thus acting as a piston pump in this instance. The vane type action of the pump then is by-passed in a manner similar to the front and rear pump action on the Turbine Drive transmission for the larger cars.

The transmission case is a one-piece aluminum die-casting, including the bell housing, case, and rear bearing retainer. The shift quadrant provides — Park, Neutral, Drive, Low, and Reverse.

The Larger BUICK Cars

The engine setup of the larger cars remains exactly the same as last year, the same tabular data being repeated.

The chassis frame is now of cruciform construction in which the side members are brought together to form a central box section.

Front suspension is new, incorporating an alloy steel forged steering knuckle of conventional design. It also carries a boss for the fixed anchor of the front brake assembly. Front wheel hubs are redesigned to accommodate tapered roller bearings.

The rear suspension is entirely different, due to the elimination of the torque tube. It is of three-link design, with two lower links taking the driving forces.

They are connected to the frame at the front end, and to brackets on the axle housing at the other end. All mounting points are pivoted in rubber bushings. To prevent axle rotation incident to braking and acceleration, the third link is mounted between the frame side rail and axle housing to a bracket on the upper right side of the housing. The third link is of adjustable design to effect the proper joint angle in the two-piece driveline.

Internally the rear axle remains the same as before. However, the drive pinion is revised for attachment of the companion flange on the rear U-joint. The differential carrier is changed to reduce weight and eliminate the flanges previously required for torque tube attachment.

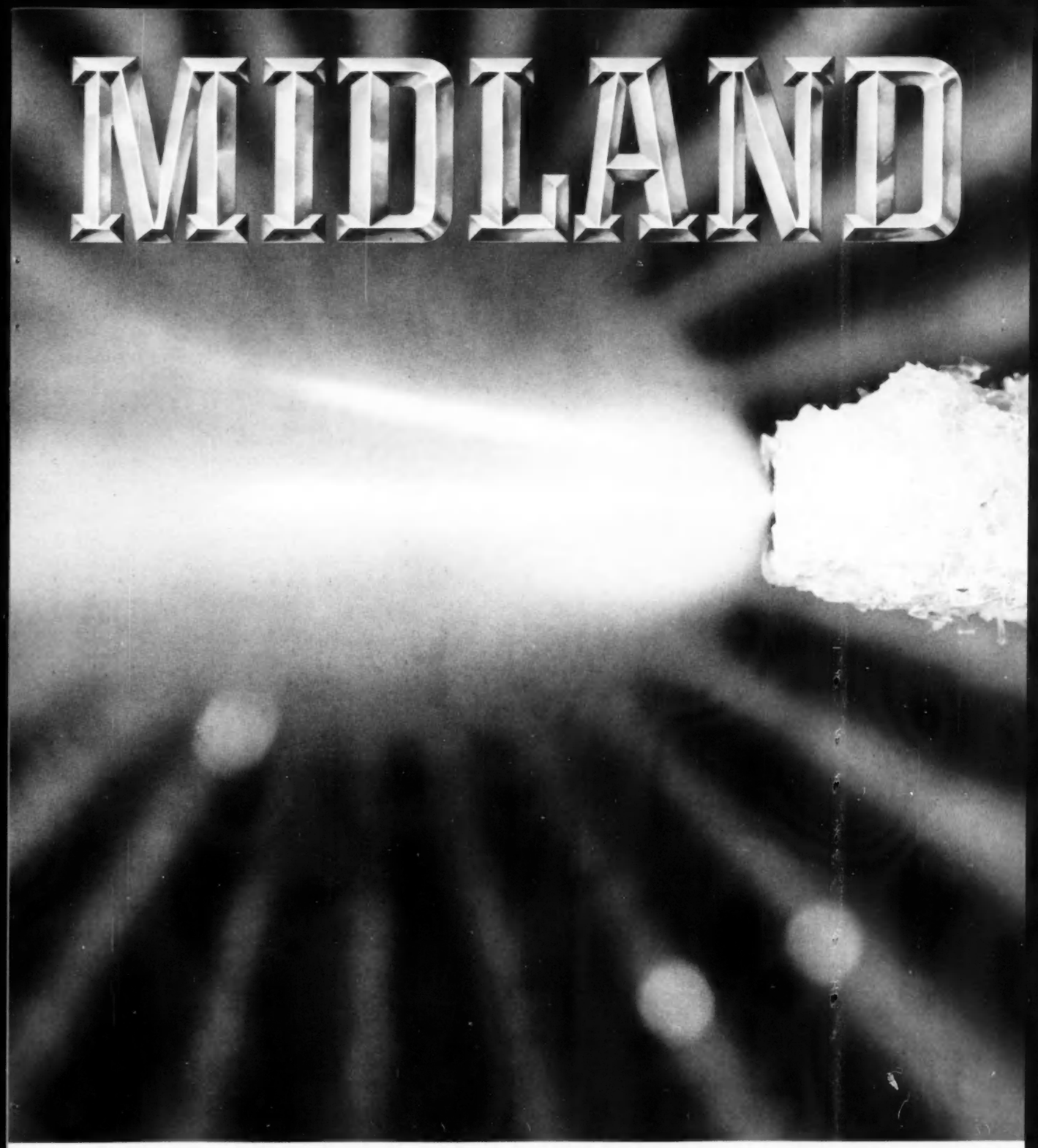
The driveline is of two piece type, similar in arrangement to the one on the Special but, naturally, of larger size.

Front brakes are redesigned to provide a fixed precision-location anchor pin mounted directly in a boss on the upper portion of the steering knuckle forging. Rear brake assemblies, too, have the fixed precision-location anchors attached permanently to the backing plate.

Brake shoes are reduced in width

(Turn to page 78, please)

Circle 126 on Inquiry Card for more data ⟶



Research and Development at Work

Glacier Cold! Laboratory tested at Midland-Ross. Blasted by raw, frigid whirlwinds of freezing cold. Subjected to sub-arctic temperatures for days on end. Tests designed to produce the world's safest, most trusted brake systems.

AIR MIDLAND BRAKES

MIDLAND-ROSS CORPORATION

POWER MIDLAND BRAKES

OWOSSO DIVISION OWOSSO, MICHIGAN

ONE OF THE "400" LARGEST AMERICAN CORPORATIONS

AIR BRAKES • AIR COMPRESSORS • AIR CONTROLS • VACUUM POWER BRAKES • DIE CASTINGS • CONSOLIDATED TRANSPORTATION EQUIPMENT

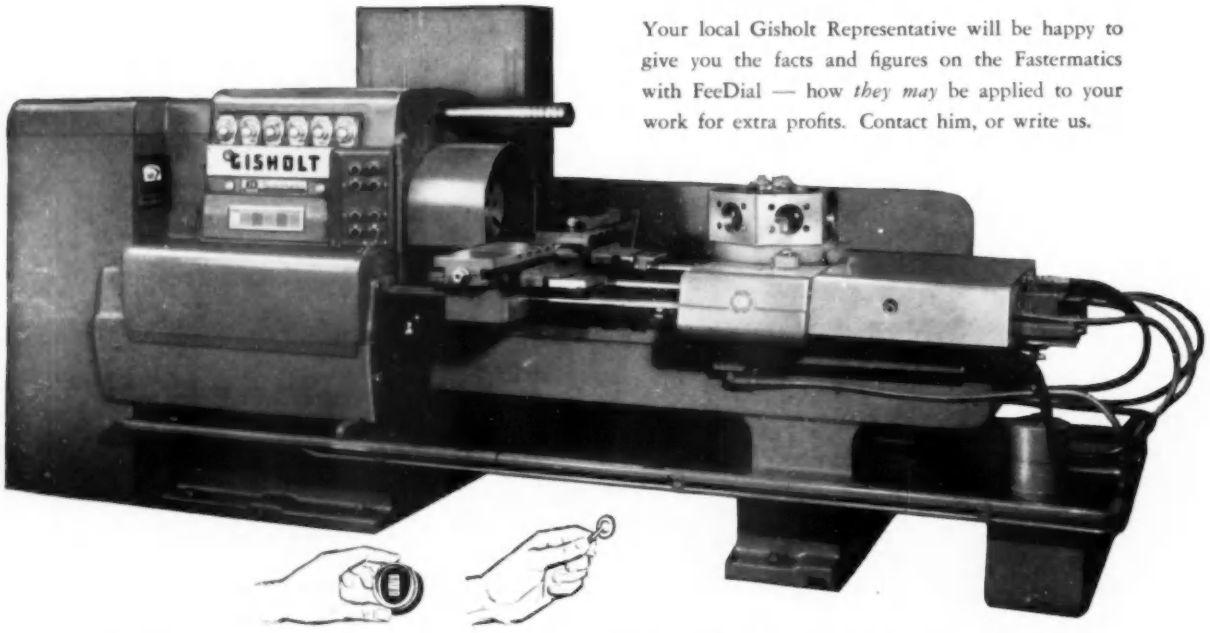
How Gisholt Fastermatics turn 90% of setup time into profitable production

Saves nearly two hours in just one setup — that's how the new 1960 Gisholt Fastermatic® Automatic Chucking Turret Lathe with FeeDial compares with the models produced only ten years ago.

Here's the record for the three models produced since 1950:			
	1950 Model	1955 Model	1960 Model
Time for spindle speeds, 6 stations	10 Min.	1 Min.	1 Min.
Time for feed rates, 6 stations	36 Min.	30 Min.	5 Min.
Time for setting traverse trips	54 Min.	18 Min.	9 Min.
Time for turret positioning	150 Min.	45 Min.	15 Min.
Total time	250 Min.	94 Min.	30 Min.

Multiply the savings shown above by the number of setups you do in your shop in one week, in four weeks . . . in one year. You'll quickly see extra profits you may now be losing with an outmoded lathe, regardless of make. That is the price of obsolescence!

Your local Gisholt Representative will be happy to give you the facts and figures on the Fastermatics with FeeDial — how *they may* be applied to your work for extra profits. Contact him, or write us.



FeeDial® and selector switches slash setup time for Automatic Chucking Turret Lathe

—lets you set individual feed rates for all six turret stations in just five minutes or less. You simply turn the dials, and that's it. And by flicking switches you can set spindle speeds and functions in only five minutes more. With such new setup speed, the new Fastermatic brings cost-cutting automatic production to a greater range of small-lot jobs than ever before.

Turret Lathes • Automatic Lathes
Balancers • Superfinishers®
Threading Lathes • Factory-Rebuilt
Machines with New-Machine Guarantee

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin, U.S.A.

Circle 127 on Inquiry Card for more data

NEW PRODUCTION and PLANT EQUIPMENT

By C. J. Kelly
ASSISTANT EDITOR

FOR ADDITIONAL INFORMATION, please use reply card at back of issue

Air Compressors

RANGING in capacity from 25 to 100 hp, a new line of air compressors has been introduced. Designated the C-Line, these two state, air cooled units are designed for compactness and efficiency. Complete air cooling eliminates the need for cooling water duty. Two stage compression, intercooling between stages, general valve areas, large air passages and good mechanical efficiency are featured on these units. *Clark Bros. Co., One of the Dresser Industries.*

Circle 41 on postcard for more data

Mobile Welder

THE Weldmobile is a self-contained, self-propelled welding unit, with engine directly coupled to the generator, not a tractor with a generator driven through power take-off. The larger wheels in the rear with ground gripper tires, the implement type tires in the front, and the greatly increased ground clearance at both axles have improved its mobility over that of previous models. The unit is designed to provide a mobile self-propelled welding unit for installations in which welding applications occur at widely separate points. By traveling directly to the job and being ready to weld without waiting for electricians to hook up power lines, the unit saves hours of time. Since its towing capacity is rated at 2000 lbs draw-bar pull, it can tow other equipment or material to the job. The 400-amp model is powered by a Chrysler 6-cylinder industrial engine and the 600-amp model is powered by a Chrysler V8-cylinder industrial engine. In addition to welding power, the Weldmobile can supply up to one kw, 110 volts DC, auxiliary power for operating lights and electric motor powered equipment. Two wells and brackets are located at the rear for acetylene and oxygen tanks. Welding, traveling and power controls are centrally located in front of the driver's seat on a special dashboard. *Hobart Brothers Co.*

Circle 42 on postcard for more data

Furnace Installation

A NEW Gantry-type furnace and associated equipment is now being installed at Lindberg Steel Treating Company's Los Angeles, California facilities. This atmospheric controlled, bottom quench, gantry-type hardening furnace accommodates a loading fixture with an effective work load of 80 in. in dia by 192 in. in length. Lindberg's gantry furnace will be electrically heated, will have three control zones of 115 KW each and will operate between 250 and 2050 deg F. According to company officials, Mr. L. A. Lindberg, President, George H. Bodeen, Vice President, and Robert W. Fish, West Coast Division Manager, the new facilities are scheduled to be completed in their specially designed new building at 2910 South Sunol Drive, on August 1st. *Lindberg Steel Treating Co.*

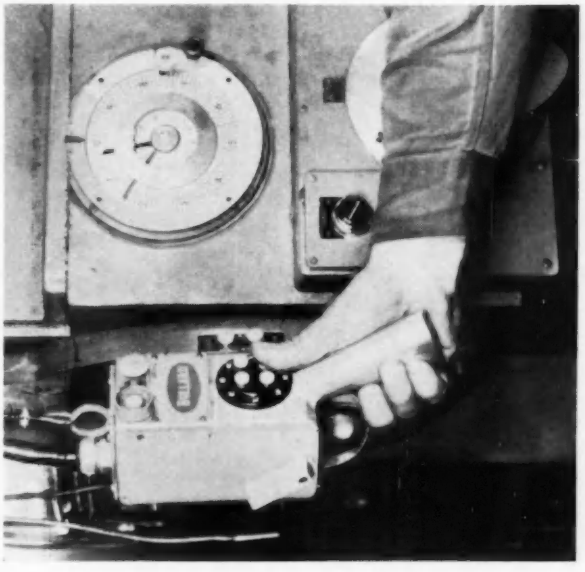
Circle 43 on postcard for more data

Horizontal Boring Mill Line With Push-Button Control

TWO-FINGER control is the main feature of a new line of horizontal boring mills that have been designed to bring the workpiece and the cutting tool together faster. Trade-named the Dynamill, the machines are available in 3, 4 and 5 in. spindle sizes. There are five different table sizes available for the line. They range in size from 36 by 60 in. to 60 by 136 in., and incorporate five standard bed lengths from 60 to 144 in. Head vertical travel can be selected from 50 up to 86 in.

In order for the operator to know the exact location of the tool in relation to the work there is a series of large clock type dials located in plain sight of the normal operating position. Separate dials show the location of the head, table, saddle and spindle indicating travel from 100 in. down to a thousandth of an inch. Each dial has three travel pointers —one for 100 in.; 10 in.; and 0.100 in. Each dial is resettable to allow any zero reference point.

With this new power control and dial system there is no need for vernier and end measures or hand cranks. The traverse speed is gauged by the pressure on the trigger located on the pendant. The repeatability of the machine is reported to be 0.0002 in. *The Bullard Co.*



This pendant has a rotating turret mounting four buttons. With these four buttons, all directions of movement of head, table, saddle, and spindle can be controlled. In one position of the turret, with the buttons at 12 o'clock, 3, 6, and 9 o'clock, the buttons actuate, respectively, movement of the head up, table right, head down, and table left. By rotating the turret 45 deg, four different movements are actuated — correspondingly: spindle retract, saddle advance, saddle withdraw, and spindle extend. The speed of traverse, and the engagement of the feed, are controlled by pulling or pushing a trigger on the pendant.

Circle 44 on postcard for more data

NEW PRODUCTION and PLANT EQUIPMENT

Hot-Cold Chamber

A NEW type of hot-cold testing chamber has been designed for use in laboratory research and development work. To accommodate both large and small equipment, the 120 cu ft chamber is constructed with removable shelves spaced 12 in. apart. Two full-opening front doors are each provided with one 20 in. square access door and four 6 in. square hand holes for adjustment of equipment within the chamber, and two 16 by 24 in. multipane observation windows. Chamber temperatures are adjustable from +300 deg F to 150 deg F. Two fin coil blower assemblies with 2500 watt heaters provide both heat and air circulation. Low temperatures are provided with a refrigeration system of approximately 800 Btu/hr at 35 deg F. Refrigerant tubes completely surround the chamber for uniform temperature distribution. Interior dimensions of the chilling chamber measure 60 in. long, 96 in. high and 36 in. deep. Exterior dimensions are 68 in. long, 104 in. high and 44 in. deep. *Cincinnati Sub Zero Products*

Circle 45 on postcard for more data

Engine Thermomotor

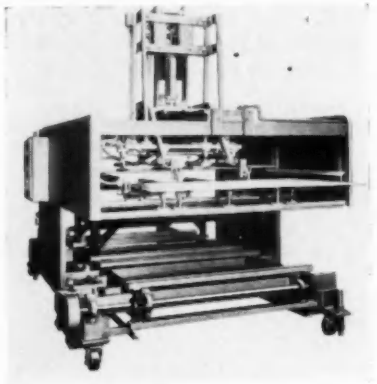
A thermostatic powered Thermomotor which provides automatic adjustment of radiator shutters has been designed for use on truck and stationary engines. The Thermomotor is a self-powered modulating unit. It will adjust a shutter to maintain a constant coolant temperature to plus or minus two degrees. It will deliver 100 lbs of force with 1½ in. of travel of a 3 in. lever arm.

It is not affected by vibration and has a corrosion resistant aluminum housing. Installation is simple and the unit requires only intake and outlet connections. The Thermomotor can be made to maintain any temperature setting by changing the internal thermostat. *Dunlap Mfg. Co.*

Circle 46 on postcard for more data

Destacker Sheet Feeder

THIS automatic vacuum cup destacker will lift one sheet at a time from the top of a stack of blank sheets, index forward, and deposit the sheet on the feed station. The lifter mechanism then returns and picks up another sheet. As this sheet is indexed forward to the feed station, pushers, attached to the lifter mechanism, push the previously loaded sheet from the feed station through a double sheet



detecting safety device into the metalworking machine.

When pallets or dunnage are used the stock index conveyor is huilt with an empty pallet removal station. After the first pallet has been completely destacked, the index conveyor moves the next full pallet into the destacking position. This action moves the empty pallet from the destacking position to the removal station. In this location, the empty pallet can be removed from the conveyor and at the same time a full pallet can be positioned on the preload station. This method of loading and unloading the conveyor allows for nearly continuous operation with a minimum interruption.

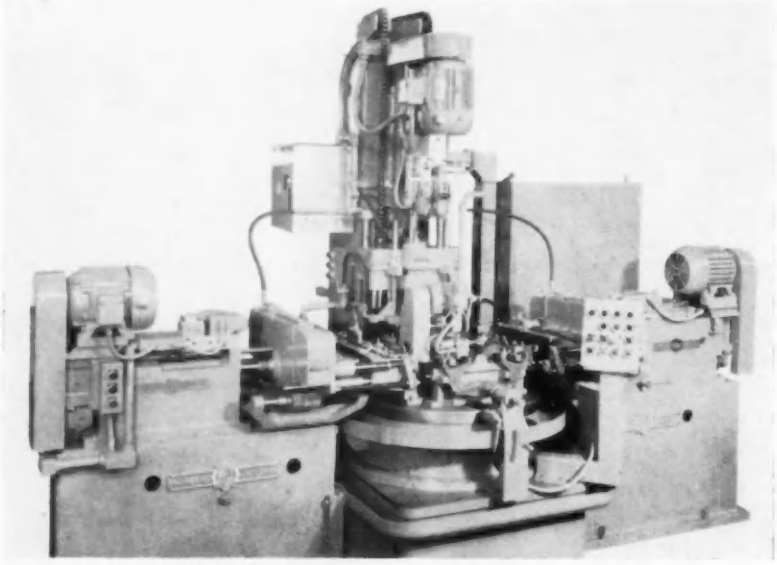
This unit is completely self-contained, floor-mounted, does not require a pit or foundation, and includes both automatic cycling and manual inching controls as well as sheet separator. It is made in various sizes and arrangement to suit any particular application. *Die & Automation, Inc.*

Circle 48 on postcard for more data

Four Station Automatic Indexing Machine

MACHINE Serial 1303 is a four-station automatic indexing machine to drill and ream automotive Rocker Arm Shafts. The machine employs three R-J self-contained hydraulic quill units. The vertical unit is equipped with a 12-spindle head and the two horizontal units each have a 14-spindle head. Holes are drilled on the diameter of the part as well as drilling and reaming a hole in each end of the shaft. The end holes are drilled when the part is at station 3 by spindles in the horizontal units and are then reamed by spindles in the same heads when the part is in the unload station. On the center post of the 36 in. diameter index table, a small air-operated quill is arranged to drill a 5/16 diameter hole directly opposite the hole being drilled from the horizontal. Fixtures are manual and the parts are clamped in vees, and location of the parts endwise are taken from notches milled in the Rocker Shafts. *Rehnberg-Jacobson Mfg. Co.*

Circle 47 on postcard for more data



Based on an eighteen second unload and load, production is approximately 200 pieces per hour.

Roll Grinder

DESIGNED model 181-A, the crush-true roll grinder features fully automatic grinding and crushing of the wheel. It has variable speed control for automatic fast and slow feed of the wheel into the work, and an automatic plunge grinding device with 1 in. rapid approach and retraction of the wheel to the work. In addition, the wheel has cam controlled feed of 0.500 in. with dwell time variable. Other features include: swivel-type work table, electro-mechanical controls, anti-friction, grease sealed wheelhead spindle, central lubrication system for ways, and eyelevel push button control panel. Approximate floor area is 97 by 102 in.

Machine Specifications are: wheel speeds 1150, 1270 and 1390 rpm, maximum longitudinal adjustment is 24 in. Table swivel; clockwise or counterclockwise 5 deg. Wheelhead rapid traverse is 1 in. Maximum wheelhead feed 0.500 in. The wheelhead motor is 15 hp, and the workhead motor is 1½ hp. *The Sheffield Corp.*

Circle 49 on postcard for more data

Gaugeless Pressure Regulators

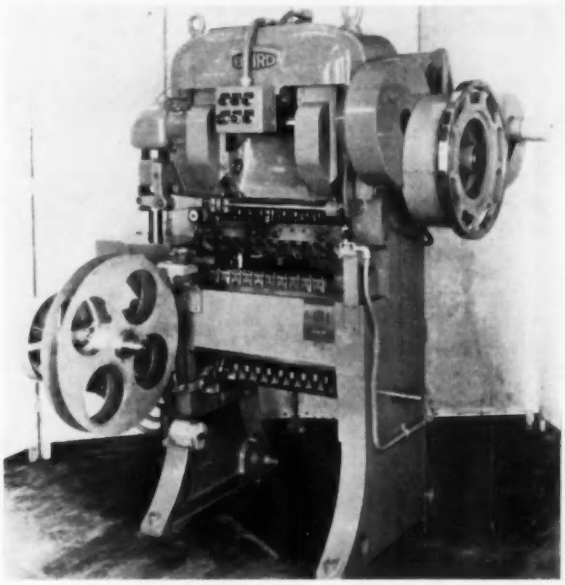
TWO-STAGE gas pressure regulators, without the conventional glass covered gauges, have recently been made available for both oxygen and acetylene cylinder use in welding, heating or cutting operations. The new regulators are particularly useful where extremely rough usage is encountered, and where continuous quality performance is necessary. Delivery pressure is set with a micrometer type indicator. Two ranges of regulation are available by means of a low-high marking on the adjusting knob, and three lines on the spring case. The position of the adjusting knob in relation to the lines on the spring case determines whether high or low readings apply. The gauges are also equipped with a cylinder pressure indicator clearly visible at the top of the regulator and protected from damage by a forged brass housing. The regulators available are an oxygen regulator with a maximum work pressure of 100 psi and two acetylene regulators with a maximum work pressure of 15 psi. Conversion kits for changing conventionally gauged regulators in the same class to gaugeless regulators are also available. *Air Reduction Sales Co., a division of Air Reduction Co., Inc.*

Circle 52 on postcard for more data

Electric Clutch Brake for Transfer Press

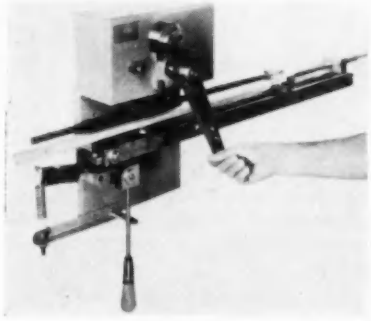
An electric clutch brake is now available on Baird's transfer presses model 2-19 and model 3-25. The high speed transfer presses produce stamped and drawn parts from roll stock. The clutch brake stops the machine in ½ revolution, preventing damage to tooling and parts. The new clutch can easily be incorporated into electronic gauging and inspection of parts during production runs and also allows a single operator to run several machines simultaneously. The manufacturer anticipates that the electric clutch brake will be standard equipment on both models of Baird Machine's transfer presses soon. The Baird Machine Co.

Circle 50 on postcard for more data



Tube Marking Unit

A NEW graduating machine has been designed for marking accurate calibrations on aluminum, brass and other metal tubing. This new machine, designated number 598, is manually operated. A single rotation of the 8 in. dia marking wheel provides fractional graduations on a 24 in. tube. The operating handle is balanced to hold in any position and the marking accuracy is obtained through a gear and rack arrangment that assures a true



length of calibration, over the 24 in. length. The tube has support both inside and out, as the marking is applied. To accomplish this support the work table carries a mandrel rod extending in a close fitting manner, for the full length of the tube. Directly underneath the marking contact point is a bushinged roller through which the pressure is applied by means of a hand operated cam which makes depth adjustment very simple. To operate, it is only necessary to slide the tube into the mandrel, swing the cam lever and turn the hand wheel one rotation. The simplicity and ease of operation make substantial hourly production possible and the point of contact method of marking insures sharp, clear, uniform and precise graduation and number markings. *Acromark Co.*

Circle 51 on postcard for more data

Positioning Control System

NAMED Rapac, a new point-to-point positioning control system is reported to provide accuracy to ± 0.001 in. and repeat accuracy to ±0.005 in. This system will direct a wide variety of machine tools including drill presses and boring mills, and is also suitable for multiple axis control. It utilizes punched tape for predetermining sequences.

Featured is a linear transducer which is not subject to wear or deterioration. The transducer indicates the direction of travel toward the desired positioning point at all times.

Rapac does not require special machine designs. It will operate with virtually any precision machine tool or device requiring accurate positioning. It is available as a complete system, or in components for measuring sub-systems, drive sub-systems, and data decoding sub-systems. *Square D Co.*

Circle 75 on postcard for more data

Roll Feeds

DESIGNED specifically for high speed punch press automatic operation, these feeds are ruggedly constructed throughout, roller or ball bearings are used for all rotating parts, the lower roll rotates in sealed ball bearings which never need lubricating.

These units have a top roll release with a lock-out device. The top roll is automatically reset by a starting key that is actuated by the downward movement of the press ram. A



feature is the high speed disc type brake that has double the usual braking area and is air cooled by means of a fin-type housing.

These roll feeds mount directly on the press bolster to feed from either side, front or back. Two types of drives are available, direct or compound geared, the latter for feeding longer than rated lengths. They are available in 14 sizes with maximum feed lengths from 2½ to 12 in. and a variety of stock widths from 4 to 12 in. *Cooper Weymouth, Inc.*

Circle 53 on postcard for more data

Two New Gear Shapers Added to Line

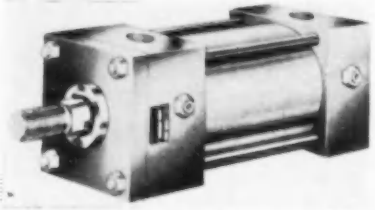


Twin-column gear shapers have been introduced to the industry to embellish an existing line of shear-speed gear shapers. The models 3053, for gears from 3 to 5 in., and 3073, for a 5 to 7 in. range, incorporate the same principle of operation as the units available for larger gears. Multiple single point tools feed toward the center while the work reciprocates up and down to produce all teeth or forms on the contour of the work simultaneously. Michigan Tool Co.

Circle 54 on postcard for more data

Pressure Cylinders

ADDED economy in low pressure cylinder applications is now possible with a newly improved series of cylinders that can be used without any modification in either air or hydraulic systems, according to the man-



ufacturer. Incorporating reverse trim packings and multiple-lip rod wiper that cleans in two directions to deliver a dry rod on the outstroke, S-P engineers have designed an interchangeable cylinder that can be used for all types of industrial applications at pressures up to 200 psi air and 500 psi oil or water. Built to major automotive manufacturers' and JIC standards, this new series air or hydraulic cylinders are available in 21 different mounting styles and eleven bore sizes from 1½ through 14 in., with strokes to user's specification. Precision-honed hi-tensile brass cylinder tube, hard-chrome plated piston rod and rust-proofing of all ferrous parts afford maximum resistance to corrosion. Full area ports, available in alternate positions, provide greater cylinder speed and power since they are equal to or greater than the internal area of standard pipe sizes corresponding to pipe ports. Piston seals and removable cartridge-retained rod seals are rated for operation at temperatures from —20 to 150 deg F. Special seals for higher or lower temperatures are also available. *S-P Mfg. Corp.*

Circle 55 on postcard for more data

METALS

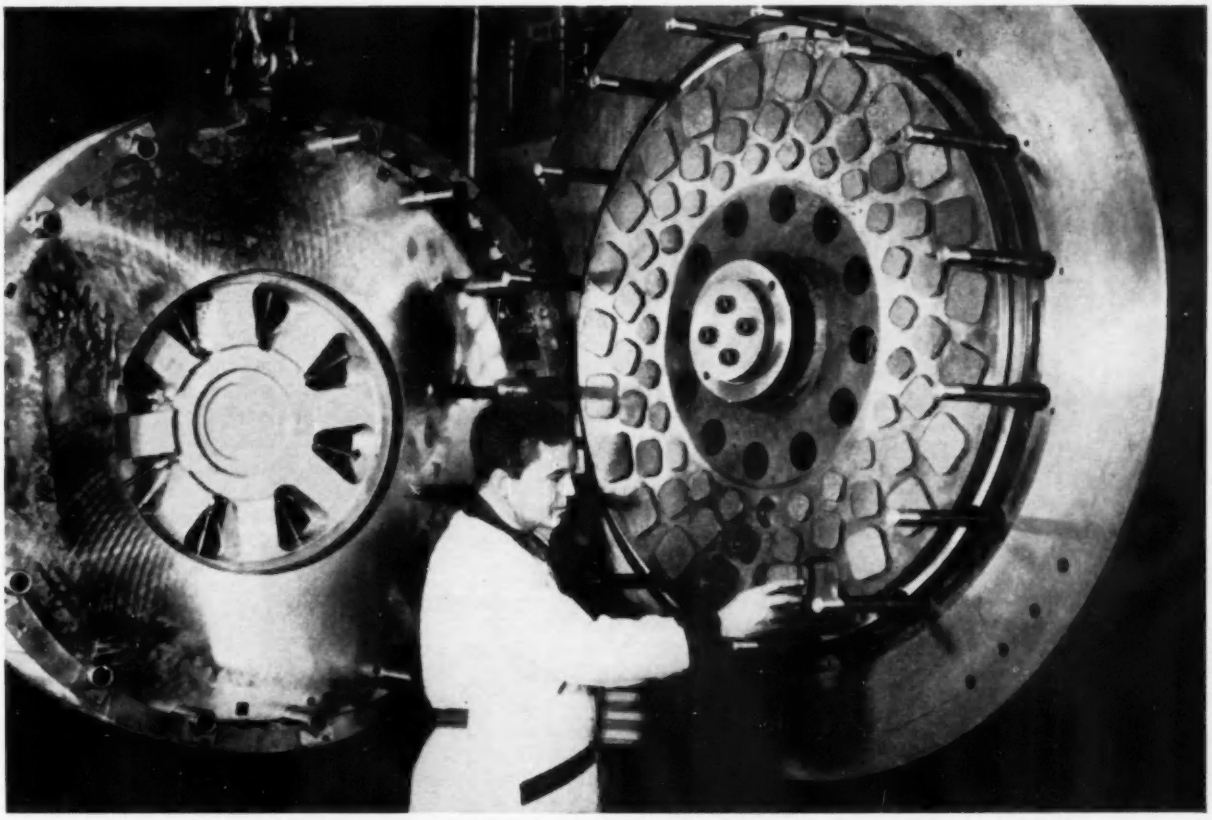
(Continued from page 57)

smelter stocks at long last registered a decline of 4300 tons, ending a dismal climb since March, when they totaled only 136,500 tons, to advance to 207,000 at the end of July.

In consequence, there is now a better chance that the 13-cent East St. Louis price will hold for the rest of the year. There has been a revival of buying by the diecasters, doubly welcome because of slow demand during the last quarter. This was in anticipation of 1961 model car output. The custom diecasters now predict a fourth quarter upturn that will carry 1960 total die casting production to better than the 1959 levels. If 6 million cars are made in 1961, zinc die casting consumption should approach the all-time high of 1955 when 8 million cars were produced with fewer die casting components.

Galvanized Sheets for Unitized Bodies

Use of galvanized sheets on unitized bodies of the new compact cars appears certain to provide larger market demand for zinc. Its use will effectually combat serious corrosion from salt now used extensively in winter road maintenance.



Unique R/M friction blocks float free in this clutch lining retainer of the air clutch and brake on a giant 4000-ton Danly press.

How R/M friction blocks with special structural core licked high shear and abrasion

Engineers of Danly Machine Specialties, Inc., Chicago, and friction specialists of Raybestos-Manhattan collaborated in the development of a special "core-type" free-floating friction block to solve a problem involving high shear forces and abrasion.

Design reduces inertia

Danly's exclusive air clutch and brake used on mechanical presses from 25- to 4000-ton capacity greatly reduces start and stop inertia, with corresponding reduction of wear on friction surfaces. The standard design employs blocks of solid friction materials. These blocks float freely in openings in the clutch and brake lining carriers.

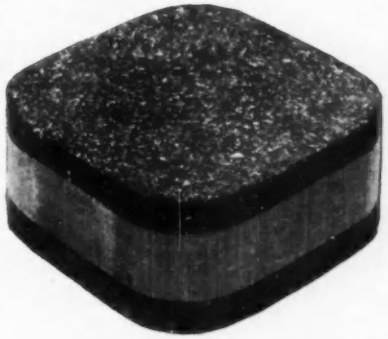
For severe service applications it was necessary to find a material which would stand the high shear and compressive forces at the points where the friction material was supported in the steel carrier.

The problem was solved by the development and application of a special high structural strength organic core (Pyrotex) to combat shear and abrasion. The $\frac{3}{4}$-in. core is sandwiched between two $\frac{3}{8}$-in.-thick facings of asbestos friction material which gives high impact strength, excellent wear resistance, and is non-abrasive. It also has high compressive and shear strength with high-temperature stability.

This is another example of R/M's ability to adapt proven friction materials for special shockloading, stress or wear applications. Only R/M manufactures *all types of friction materials —your assurance of sound, unbiased advice on the material best suited to your application.*

Experience, service

To take advantage of R/M's more than 50 years of friction experience and its outstanding service—just phone or write. A sales engineer can be at your desk within 24 hours.



Special friction block—Two $\frac{3}{8}$-in.-thick facings of asbestos friction material are bonded to a $\frac{3}{4}$-in. Pyrotex structural core.



You will find this R/M Bulletin 501 packed with useful engineering data on friction materials. Why not write for it today —no obligation.

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NEW PRODUCTS AUTOMOTIVE-AVIATION

FOR ADDITIONAL INFORMATION, please use reply card at back of issue

By C. J. Kelly
ASSISTANT EDITOR

Power Takeoff Unit

Production of a new type power takeoff unit that can deliver 70 hp without requiring changes in other power train components, has been announced. Designed the P-200 flywheel power takeoff, the new Clark design bolts to the engine flywheel housing, thus is ahead and independent of the clutch and transmission. Primary applications are vehicles such as transit concrete mixers, fire trucks, fuel trucks and for equipment where large amounts of engine power are required to drive accessories. The takeoff is readily adapted to any gasoline or diesel engine with either SAW number two or three bell housings. It adds only eight inches to the power train lengths. Two speed ratios—1.27-to-1 and 1-to-1—are available in standard production models. Power is transmitted from the engine to the vehicle clutch and transmission by a shaft running the length of the takeoff unit and through a gear train to the power takeoff output shaft. All gears are helical types, lubrication is self contained, and built-in vibration dampening prevents transmission of torsional impulses to the drive. *Clark Equipment Co.*

Circle 30 on postcard for more data

Plastic Resins

Tough, armor-like coatings—their almost limitless applications ranging from automobile bumpers to sensitive recording tapes—have been developed from a new family of polyester plastic resins. The manufacturer reports they have exceptional resistance to abrasion, ultraviolet rays, chemicals and weather. Other advantages of the new vitel resins include excellent adhesion, clarity, electrical properties and the ability to bind pigment. Applications with the most promise are as clear, tinted or colored coatings for metals and such automotive hardware as bumpers and wheel covers. The coatings can be applied by spraying, dipping, roller coating, brushing, hot melt, knife coating and most other methods of commercial importance. The new coating resins mark Goodyear's third entry into the field of polyester materials. The others are a polyester laminating film and a polyester resin for synthetic textile fibers. *Chemical Div., Goodyear Tire and Rubber Co.*

Circle 31 on postcard for more data

Million Lb Spring

Announcement has been made of a new 1,000,000 pound liquid spring, using liquid compressibility. An example of the capacity of this one foot dia by two foot highspring is its capability of supporting three of the largest locomotives if a way could be



found to stand and balance them end to end on this liquid spring, the manufacturer reports. Uses of this ultra high force spring include supporting entire missile complexes against shock, ship and catapult bumper systems and heavy construction equipment. *Taylor Devices, Inc.*

Circle 32 on postcard for more data

Transistorized Ignition

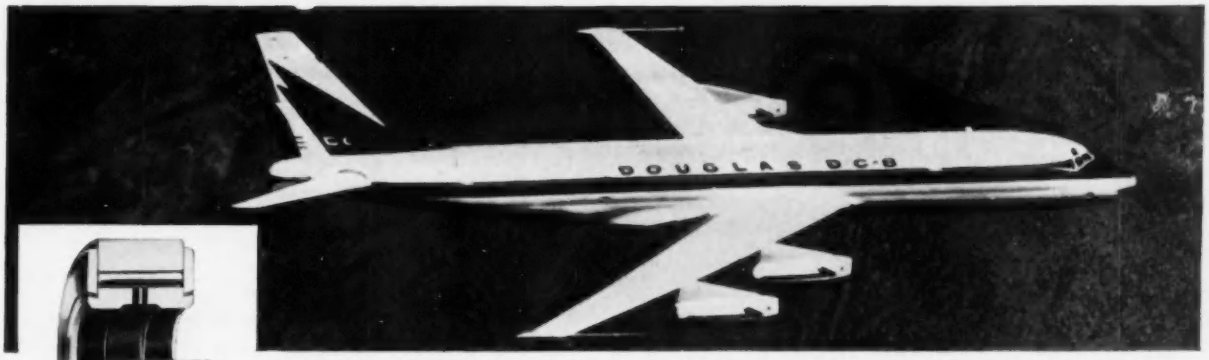
As announced, this new transistorized ignition system consists of a special hermetically sealed ignition coil, and hermetically sealed transistor circuitry, with heat sink and hardware necessary for easy installation. This new concept in ignition, thoroughly proof tested, according to the sponsor, actually represents the first ignition system featuring transistor circuitry which has ever been offered for auto, marine, and industrial use. The manufacturer reports that advantages of this new system include an increase in gasoline mileage; high-speed performance with minimum motor tune-up and maintenance; and faster, more dependable cold-weather starting. It provides the combined advantages of magneto high-speed performance with battery ignition low-speed operation. Because the points handle substantially reduced current—longer point-life is achieved; the ignition setting can now be maintained indefinitely—being limited only by the cam follower-wear rather than point-contact erosion. *Auto-Marine Laboratories*

Circle 33 on postcard for more data

"Custom-Fit" Bolts

A simple, economical means of obtaining exacting radial fits in all holes has been reported by the introduction of Adjusto-Fit adjustable diameter bolts. Any degree of tightness—plus the ability to compensate for wear—is made possible by this new development which makes reaming of holes, taper pins and expensive close tolerance machining obsolete, the manufacturer claims. These bolts also provide new installation and removal simplicity. No pressing or careful matching of bolts to holes is required since adjustable wall-thickness bushings are incorporated permitting bolts to slide into the bore of the hole and be tightened to exacting degrees of clearance or tightness. Bolts are available in mild steel and a wide variety of other materials for applications ranging from the most economical commercial to ultra-high stress aircraft and missile uses in nominal bolt diameters and lengths. *Adjustable Bushing Co.*

Circle 34 on postcard for more data

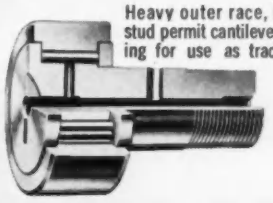


Extra heavy outer race for heavy rolling loads. Also available in double row type.

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Tremendous speeds and carrying capacity of jet aircraft impose heavier than ever loads on the flaps, yet their operation must be smooth, efficient, 100% sure. Torrington engineers developed larger, tougher track rollers and cam followers... bearings specially designed for performance and the utmost in dependable commercial jet service.

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THE TORRINGTON COMPANY Torrington, Conn. • South Bend 21, Indiana

Circle 119 on Inquiry Card for more data

Buick 1961

(*Continued from page 68*)

—2¼-in. at the front, two-inch at the rear. Despite this, changes have been made that increase drum-swept area from 303 sq in. to 327 sq in.

Although the Turbine Drive transmission, now standard on all models of the regular line, remains the same in basic design, its length has been reduced by six inches to accommodate the new drive line. Moreover, the case and rear bearing retainer are more compact to effect a lower floor tunnel.

Power steering remains standard equipment on Electra, optional on LeSabre and Invicta. ■

Lincoln Continental

(*Continued from page 43*)

a lower cut-in point.

The starter is entirely new and is of positive engagement type. When the ignition is turned on, a plunger pole, which is part of the starter field, causes the pinion to engage the ring gear and hold it in engagement until the engine is started.

Another distinctive feature is the first example of a hydraulic windshield wiper system on a passenger car, driving 18-in. blades. It gets its power from the return line of the power steering mechanism.

To achieve a smaller front tunnel, the engine is mounted at an inclination of 7 deg and this is combined with a smaller transmission case, employing a 14.1-in. diameter ring gear and a shallower oil sump. Aluminum is used in the converter bell housing and transmission extension.

A Dana constant-velocity universal joint now is used at the front. The slip joint too has new features. Discarding the splined joint used heretofore, Lincoln has developed a unique needle bearing slip yoke, using two chromium-steel needle bearing assembles. This is claimed as a first in the industry.

The main structural members in the underbody, as well as rocker panels, now are made of galvanized steel. The company has uncovered a new type of rust-proofing material which is used in the paint tank into which the body is dipped almost to the belt line.

In the convertible models it is necessary to partially retract the rear door glass when doors are operated simultaneously. When the rear door exterior lock button is depressed, or the interior door handle pulled back, the rear glass drops some 6 in. to give adequate clearance, returns automatically to normal position after the doors are closed. This automatic action is accomplished electrically by a system of three interconnected switches. ■

Berman Aids NASA

Dr. Kurt Berman, manager of liquid propellant rocket engines for General Electric Co.'s Rocket Engine Section, has been appointed to the Research Advisory Committee on Chemical Energy Systems of the National Aeronautics and Space Administration.

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The superiority of the vast number of products that are — and can be made from Roebling Cold Rolled Flat Spring Steel is a fact known throughout all industry.

You pay for mechanical and dimensional uniformity when you buy flat spring steel . . . you get it when you buy Roebling.

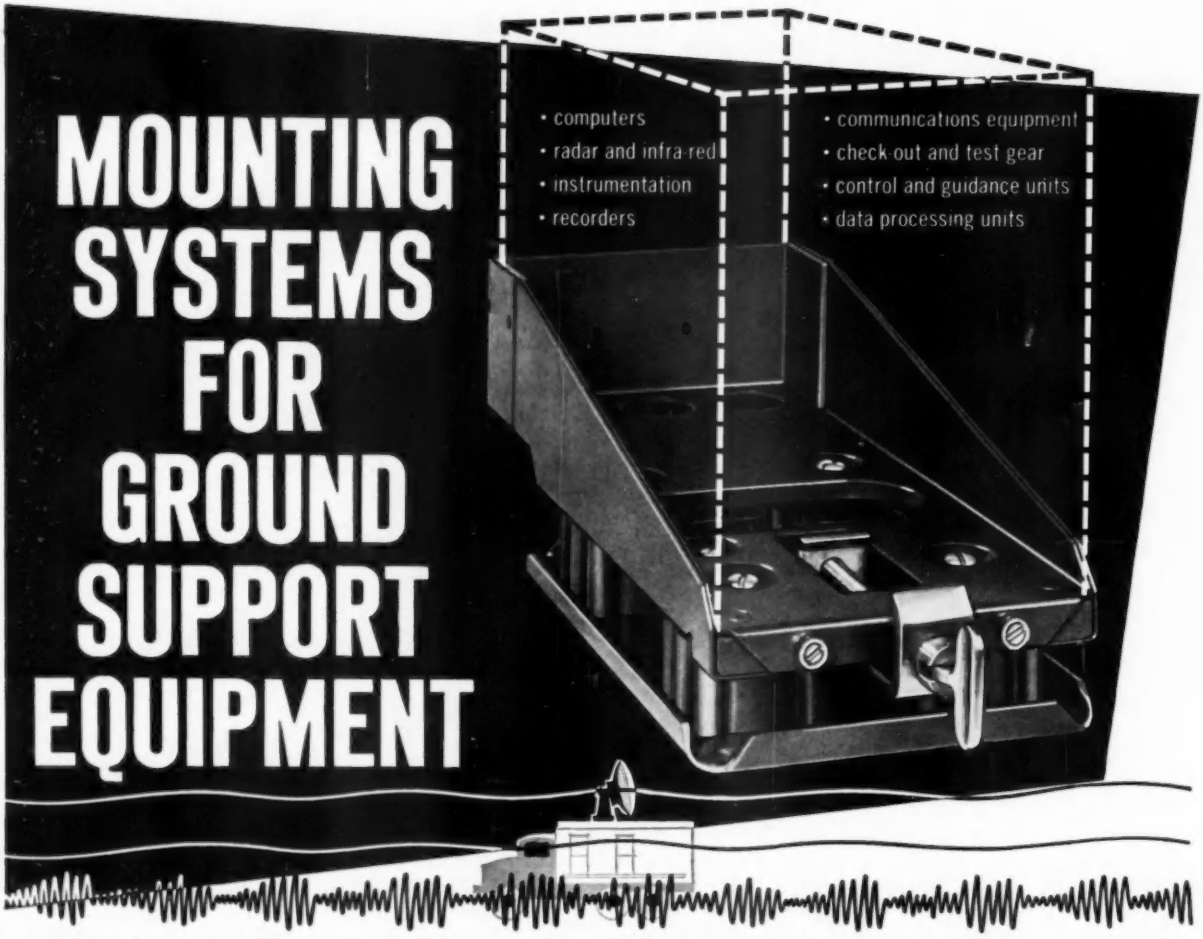
For information on how our products can help yours, write Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey.

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MOUNTING SYSTEMS FOR GROUND SUPPORT EQUIPMENT



protect sensitive equipment against punishing environments

Engineers responsible for the reliability of ground support equipment will find LORD a highly qualified source for resilient mounting systems. Here's what LORD offers:

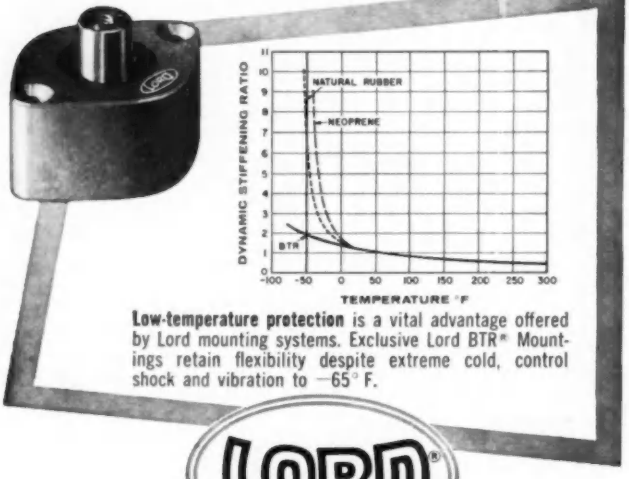
Optimum performance—assured by custom engineering on overall systems basis, and complete familiarity with vehicular environment.

Advanced techniques—resulting from unceasing research and LORD's 35-year background in vibration/shock/noise control.

Economy—made possible by proved designs, qualified components and extensive facilities for engineering, production and testing.

Minimum design time—capable field engineering personnel can be your "right arm" on vibration and shock problems. Close teamwork with your engineers moves your project to final design faster.

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LORD MANUFACTURING COMPANY • ERIE, PA.

Circle 129 on Inquiry Card for more data

Oldsmobile F-85

(Continued from page 39)

sedan; four-door Fiesta station wagons, either two- or three-seat.

Series 98: A new Holiday sedan (6-window, 4-door hardtop); Town sedan (6-window, pillar type); Holiday coupe (2-door hardtop); convertible coupe; Sport-sedan (4-window, 4-door hardtop).

From a mechanical standpoint, Oldsmobile embodies noteworthy changes and improvements. First of these is a lightweight version of HydraMatic, slimmer in profile and 70 lb lighter, permitting further reduction in body tunnel height.

The chassis frame has box-section side members extending the entire length of the frame. Instead of the former X-member construction, the box-section side members brace the four corners of the central section of the frame, surrounding the passenger compartment of the body.

The same basic 394-cu in. engine is used for the three series. On the Dynamic 88 the engine is fitted with a dual-throat carburetor and operates on regular fuel. Horsepower is upped to 250, compared with 240-bhp last year.

This engine on the Super 88 and 98 is fitted with a four-barrel carburetor, has a revised induction system, and has been provided with a new camshaft. Compression ratio is upped to 10 to 1. This version of the basic engine now is rated at 325-bhp, compared with 315 last year. It is also available on the Dynamic 88 at extra cost.

The single exhaust system is standard, dual exhaust optional at extra cost. The exhaust system this year employs both a muffler and resonator of aluminized steel.

Extensive changes have been made in the chassis, stemming partly from the elimination of the rear leaf springs, which are replaced by coil springs. Because of this change, the rear suspension features a four-link arrangement, the coil springs being mounted directly on the axle housing. The two upper links are angle-mounted from the rear axle housing to the frame to control lateral alignment. The two lower links are mounted in parallel from the axle housing to the frame.

Similar improvement has been effected in the front suspension. The ball-joint system now has permanently lubricated friction surfaces.

The new HydraMatic drive, which has 25 per cent fewer parts, features a three-element fluid coupling in which the stator element provides additional torque multiplication when starting.

In starting from a standstill, this has the effect of a variable ratio by making the maneuver with a high accelerating ratio of 3.56 to 1, automatically decreasing the ratio of 2.97 to 1 before the drive moves into second gear with a ratio of 1.56 to 1.

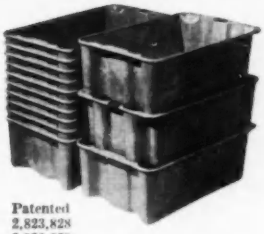
One of the unique features embodied in the 1961 line is the vertical mounting of the gas tank, surely a "first" in regular production cars. The vertical mounting permits the floor of the compartment to be made deep-dished, reaching downward to the level of the conventional fuel tank mounting. ■

LEWIS TOTE PANS

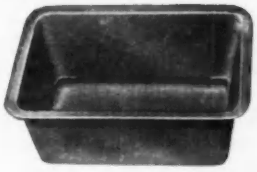
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STRONG

One-piece fiberglass molded construction; can't rust, rot, dent or bend. Stack-n-Nest® pans handle up to 3000 lbs. safe static load. Available in 8 sizes, three attractive molded-in colors.



Patented
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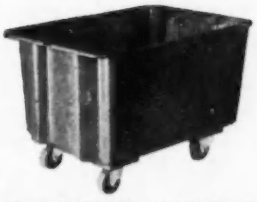


LIGHTWEIGHT

Lighter than an aluminum pan of the same size, these general purpose Lewis fiberglass pans handle bigger payloads with less effort.

. . . versatile

This Stack-n-Nest® truck is only one of the many different Lewis containers, each designed for a variety of handling operations. There are trays, pans, boxes, and trucks to fit all your handling requirements.



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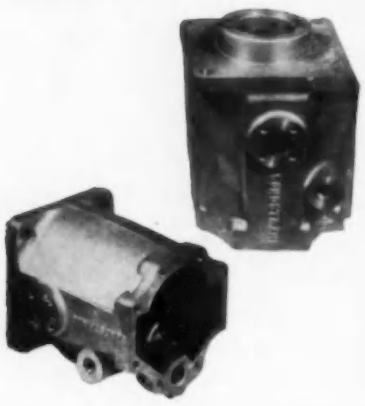
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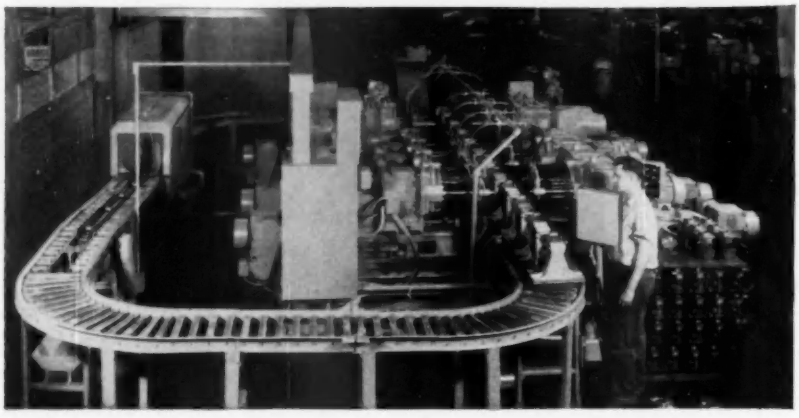
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SUNDSTRAND "Engineered Production" METHODS

...practical ideas for men who are responsible for manufacturing quality, quantity, and profit

SMALL-LOT TRANSFER MACHINING *Quickly changed heads and fixtures bring cost cutting transfer line automation to small-lot jobs.*





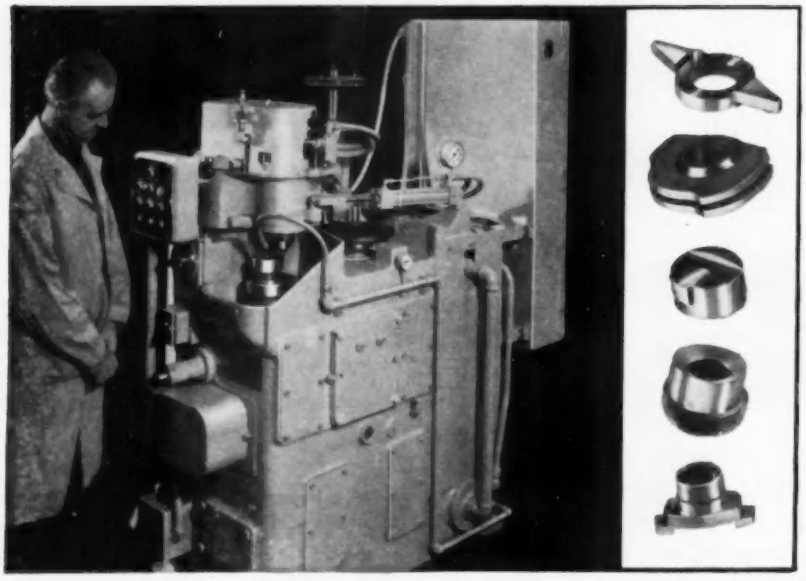
The economies of transfer line processing no longer are limited to large-volume production. This new six-station Sundstrand pallet-type transfer line is being used to process a "family" of five different hydraulic unit housings in lots as small as 500 to 1000 pieces.

The machine drills, spot faces, bores and taps the parts to precision tolerances. Milling and boring heads can be added to or replaced in the line as required. Two men can change a complete machine setup of 12 pallet-supported fixtures and 12 heads in less than five hours.

Constructed basically from standard units with specially designed pallets, fixtures and tooling, this transfer line is a typical result of a Sundstrand "Engineered Production" analysis of a specific machining requirement.

Details on request.

CONTOUR MILLING *Intricate external and internal contours easily milled on small parts with Sundstrand cam-controlled machine.*



This Sundstrand contour milling machine is adaptable to a countless number of cam milling operations on small parts for sewing machines, guns, business machines, governors, and many other products.

The vertical cutter spindle and cam follower spindle are mounted together on a pivoting arm with a 2 to 1 ratio, which reduces any cam error to ½ on the finished part.

One operator is able to attend several of these machines and produce accurate parts faster and more economically than with conventional methods.

A wide variety of machine cycles permits internal and external contour milling of workpieces up to approximately 5″ diameter. For complete information, ask for Bulletin CM-220, and describe your requirements.

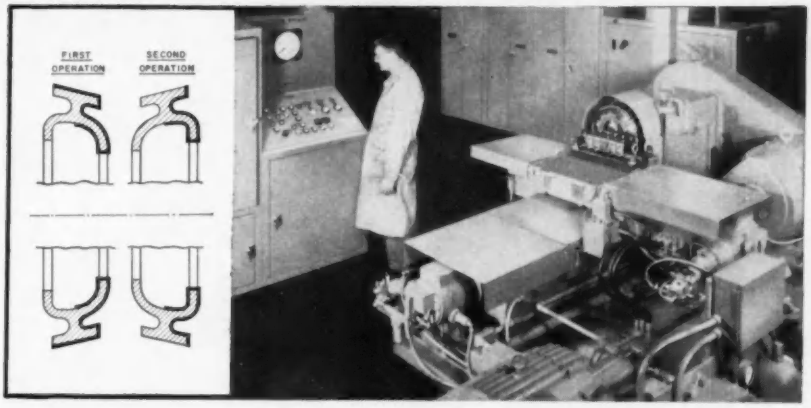
NUMERICALLY CONTROLLED TURNING

Sundstrand lathe turns turbine rings faster, more accurately than by former method.

This new Sundstrand numerically controlled lathe contour-turns stainless steel turbine rings to precision tolerances and finishes in two completely automatic cycles.

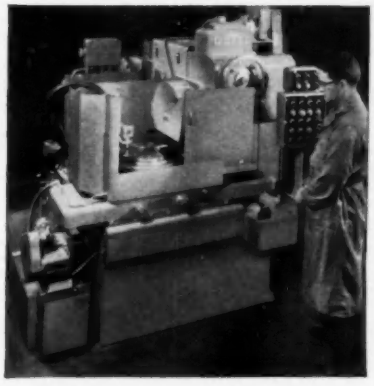
Speeds, feeds, order of presentation of each of the five carbide tools, and the path of each tool are controlled numerically. Production is increased and finish and tolerance more easily maintained than by the former method of machining.

If you want to explore the opportunities for profitable turning in your shop, ask for an "Engineered Production" analysis of your jobs.



ROTARY SURFACE GRINDING

High-production rough and finish grinding of clutch plates to a flatness of .001" with .005" repeatability.



Long ways, a rugged column, and precision construction allow this 20-hp Sundstrand-Arter machine to rough and finish grind 14" clutch plates to an over-all flatness of .001", total indicator reading — repeatability within .005" at a rate of 45 sides per hour.

Required finish of 30 to 40 microinches is readily held; but finer finish is obtainable with this machine. Stock removal is from .009" to .012".

The entire cycle is automatic, except for loading and unloading. The operator places a clutch plate on the concentric pole magnetic chuck of the first machine and the grinder fast feeds for heavy stock removal, then automatically changes to slow speed for fine finish. The clutch plate is then reversed and the operation repeated on second machine. Total production thus is 45 pieces per hour (at 85% efficiency).

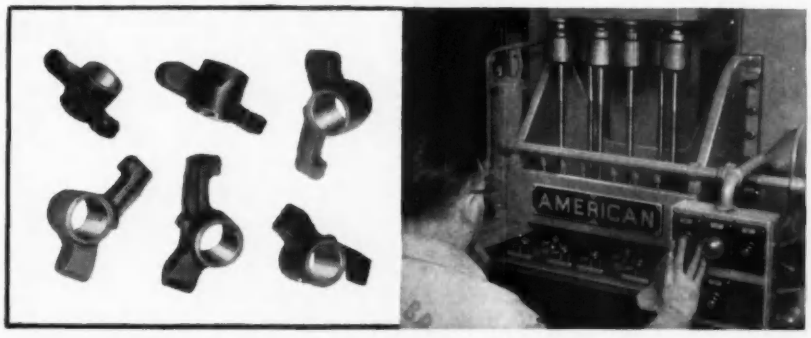
Compensation for wheel wear or wheel dressing doesn't disturb the feed setup on this versatile grinder. Also, it has a tiltable table for concave or convex grinding. Available in toolroom or production types. For details, ask for Bulletin G-220.

BROACHING

Vertical internal pull-up machine with sliding fixture handles 1200 parts per hour, six at a time.

An ideal combination of machine, proper tool design, and an efficient fixture provides highly productive broaching of the ID of hole in the exhaust valve rocker arms illustrated — 1200 finished parts per hour.

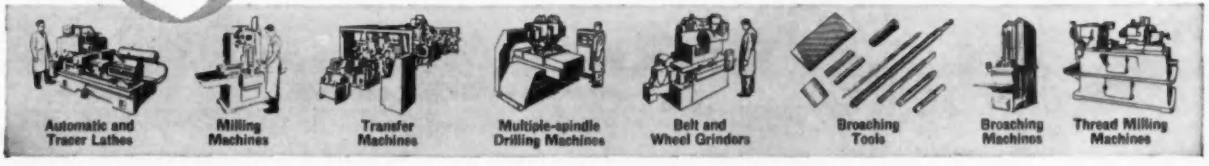
The hydraulically operated workholding fixture, designed and built by Sundstrand, features easy loading, positive clamping during broaching cycle, and automatic parts ejection. The operator loads a fixture slide while six parts are pass.ng through the broaching cycle.



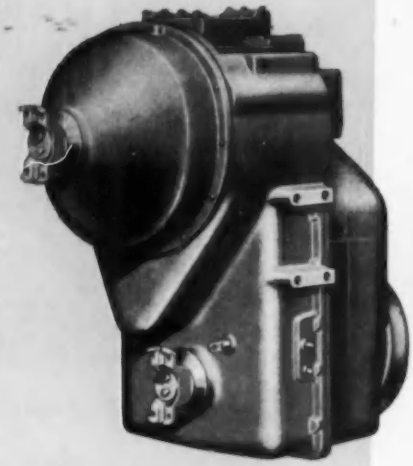
SUNDSTRAND

SUNDSTRAND MACHINE TOOL

BELVIDERE, ILLINOIS • DIVISION OF SUNDSTRAND CORPORATION



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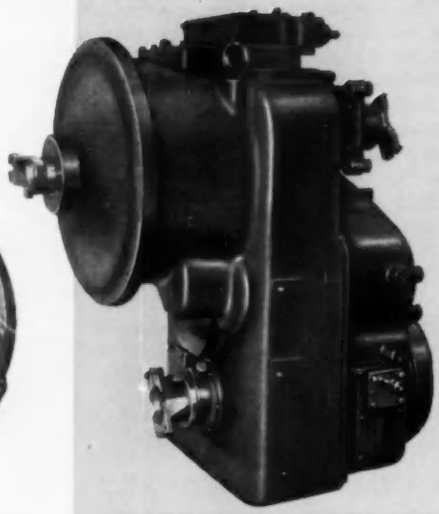
HYDRA-DRIVES
BDB
Transmission

- Four speeds forward and reverse.
- Full power shifting.
- For equipment up to 175 h.p.



HYDRA-DRIVES
Torque Converter

- 3-to-1 torque multiplication.
- Available separately, or with Hydra-Drives Transmission.
- For vehicles up to 500 h.p.



HYDRA-DRIVES
CDB
Transmission

- Four speeds forward and reverse.
- Power shift in each range both forward and reverse.
- For equipment up to 250 h.p.

PEAK POWER OUTPUT FOR HEAVY-DUTY EQUIPMENT...



Hydra-Drives®

Power Shift Transmissions and Torque Converters

Rockwell-Standard's Hydra-Drives units make hard work easy for heavy-duty equipment. The result . . . smooth, efficient, economical operation. A torque converter and 4-speed transmission in one compact package, the Hydra-Drives Power Shift Transmissions have been proved in hundreds of vehicles. They eliminate engine lugging and heavy shock loads. A 3-to-1 torque multiplication makes starting fast and effortless – even with heaviest loads.

Just a flip of the operator's lever accomplishes power shifts without interruption of the power flow. Automatic features of the converter and ease of power shifting simplifies operator training and lengthens vehicle life.

With four speeds forward and reverse, the Hydra-Drives Power Shift Transmissions are ideally suited for vehicles which must travel in both directions during a normal work cycle.

Hydra-Drives Torque Converters are the simplest, most efficient made. They can be matched with any transmission for easier, more efficient operation.

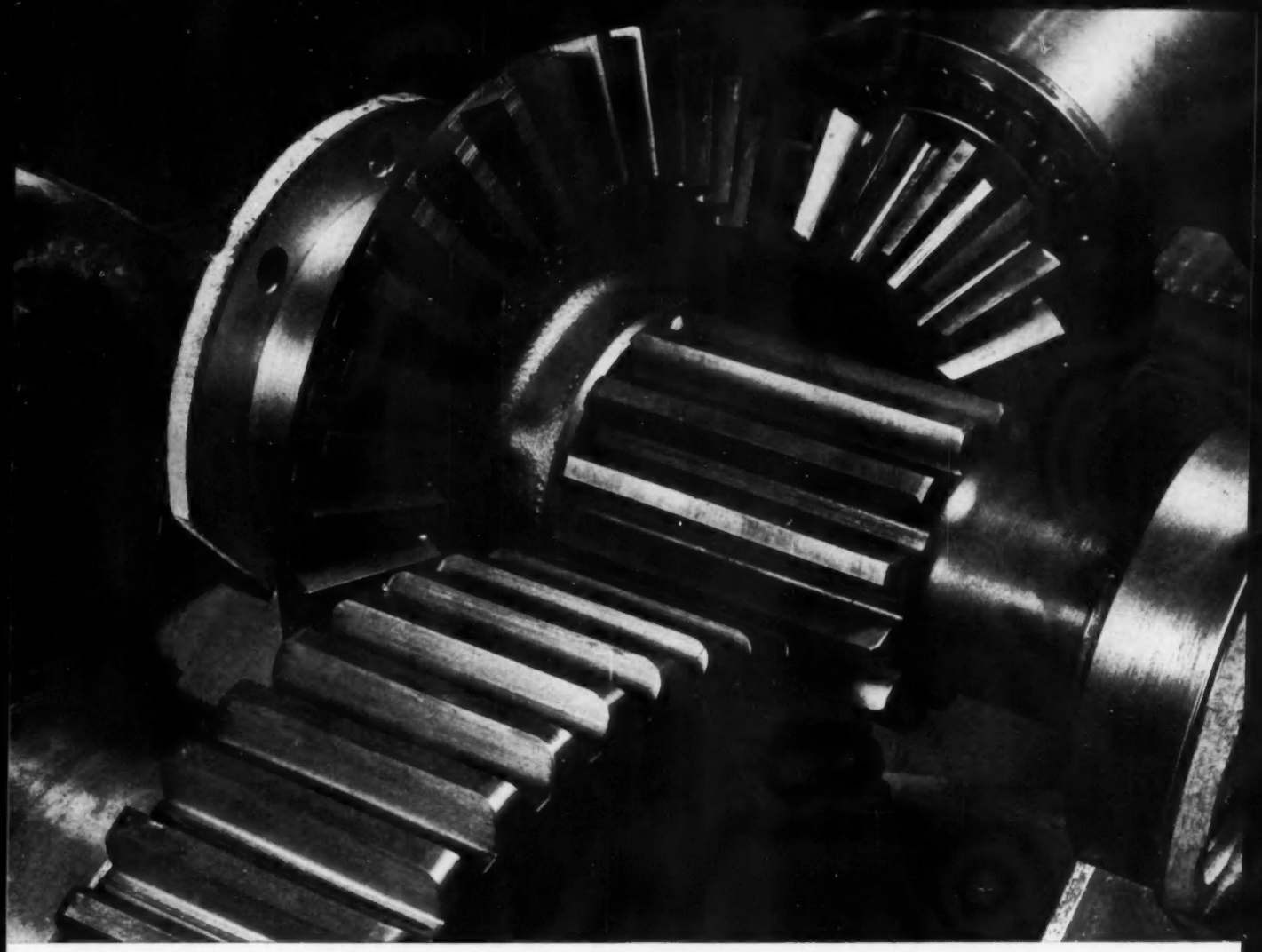
Another Product of...

ROCKWELL-STANDARD
CORPORATION

ROCKWELL R STANDARD

Transmission and Axle Division, Detroit 32, Michigan

Circle 135 on Inquiry Card for more data



These gears drive the cutting head of a Lee-Norse continuous coal miner. They have superb toughness to resist impact and wear. They're made of AISI 4820, 4320, and 4817 alloy steels.

These teeth are not for chewing

Gear teeth aren't supposed to chew anything (especially each other) because it's so very *expensive.* A broken ten-dollar gear can cost a thousand dollars in down time—so it pays to use the very best alloy steels for gears and other highly stressed parts.

When we make USS Alloy Gear Steels, every production step has one purpose: to prevent failure in actual service. These premium steels forge and machine without distortion. They are dimensionally stable, and they come in the widest possible range of mechanical properties. Be sure to specify USS Alloy Gear Steels: Carburizing steels for toughness, shock and wear resistance; thorough-hardening steels for heavy loads at slow to medium speeds; cyaniding and nitriding steels for wear.

For information or metallurgical assistance, call our nearest sales office or United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

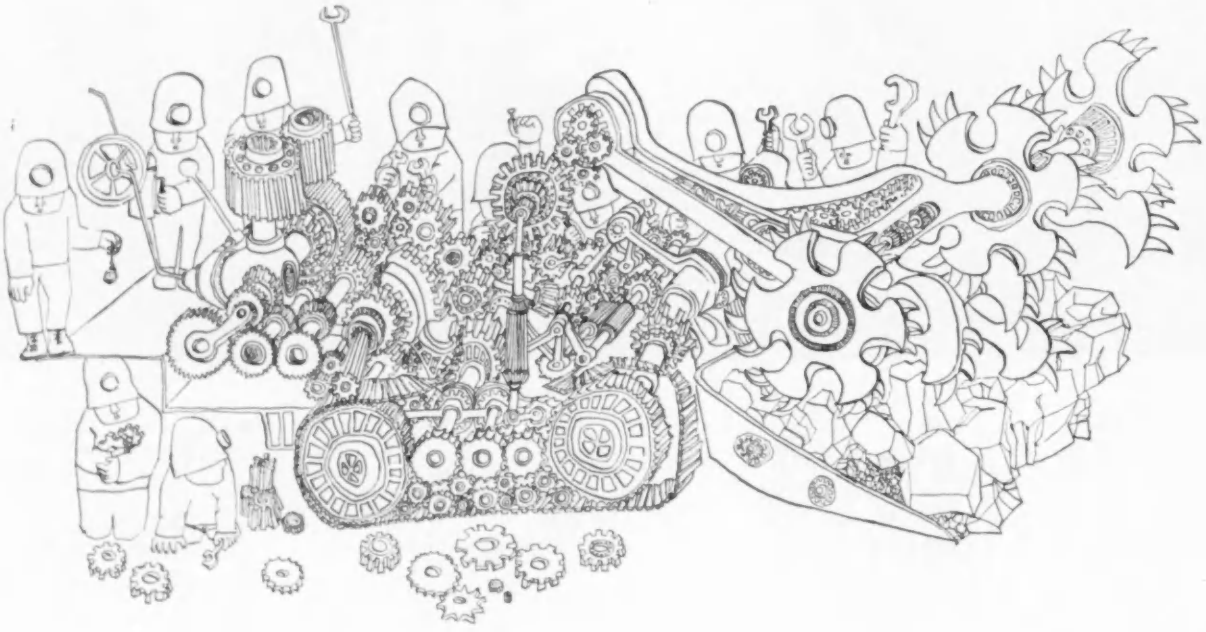
USS is a registered trademark

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company
United States Steel

USS

This mark tells you a product is made of modern, dependable **Steel.**

the digger's dilapidation



(or, How not to be a victim of tired gears)

She was a beauty when they brought her in. Shiny paint. Ferocious teeth that could chew out a whopping 5 tons of coal per minute. A drive that looked like it could rout out a vein from here to Medicine Hat, Montana, and back. At least that's the way it *looked*. Then one day fatigue set in. The old girl had tired gears. There were sounds like skis falling down stairs, a crack of doom and, wham, she stopped right in the middle of a bite. Busted gear.

Gear failure costs money, especially in terms of downtime and lost production. That's why it is essential to use *quality* alloy steel for gears, bearings, shafts and other highly stressed parts. Only the best is good enough when any failure is costly. The care and precision in making USS Alloy Gear Steels are for one purpose: prevention of failure. USS Alloy Gear Steels deliver dimensional stability. They come in a wide range of mechanical properties and processing capabilities.



The Lee-Norse Company's continuous coal miner will **never** be a victim of tired gears. Alloy steels such as 3310, 4815, 4820, 4320, 4340 and 8620 give its gears, pinions and shafts superb toughness and resistance to impact and wear. These cutter head drive gears are made of 4820, 4320 and 4817 alloy steels.

Be sure to specify USS Alloy Gear Steels for *any* of your gear requirements. Carburizing steels for toughness, shock and wear resistance; through-hardening steels for heavy loads at slow and medium speeds; cyaniding and nitriding steels for wear.

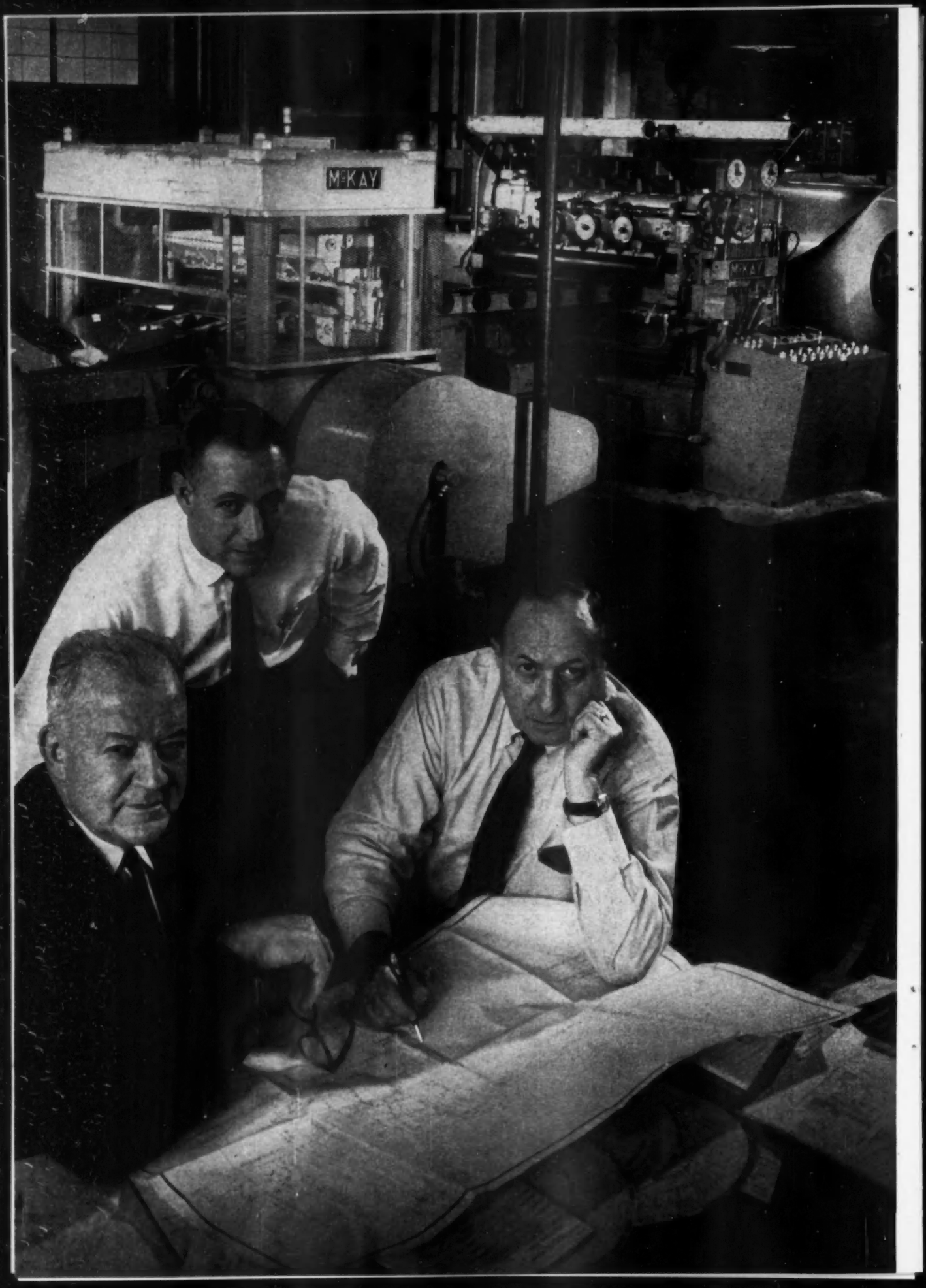
For more information and prompt metallurgical assistance, call our nearest sales office or United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS is a registered trademark

This mark tells you a product is made of modern, dependable Steel.

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company
United States Steel

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McKAY



Revolutionary New McKaymatic* Die Shear Line boosts production ...cuts scrap loss for Eastern Stainless!

Photo by Arnold Newman shows (seated left to right) W. F. Schneid, vice president—general manager, and H. J. Verner, chief engineer of Eastern Stainless Steel Corp., discussing cost reductions in stainless steel processing with (standing) McKay Machine sales engineer, Robert D. Lynn, in front of a McKaymatic* Die Shear Line recently installed in Eastern Stainless' cold strip department

"We consider the McKaymatic* the finest advancement in shearing to come along in a great many years," says W.F. Schneid, vice president-general manager, of Eastern Stainless Steel Corporation, Baltimore, Md. "We have reduced production time, cut our scrap loss, and have recorded an overall increase in department efficiency as a direct result of this new McKay die shear line," Mr. Schneid continues.

Eastern Stainless is a prime supplier of stainless steel sheets, strip and plates, for aircraft and missile parts, for food, chemical, paper and textile machinery and for architectural uses. It produces 25 grades of stainless steel in its own modern electric furnace facilities, and ships about sixty-six percent of it in sheet form.

Programs many grades instantly—Through improved roller leveler techniques, Eastern Stainless found it was able to instantly program many grades of sheet through its new McKaymatic* Die Shear Line. The line decoils, levels in a 17-roll McKay Roller Leveler, measures by electronics and cuts to length—replacing a cut-up, re-level, and re-square operation prior to boxing. Production of cut lengths has been substantially increased.

The result, they report, is cost savings. Says Mr Schneid: "As a result of our efforts to improve customer service, we installed this line to speed up production of these cut lengths. It has enabled us to break a production bottleneck for which there seemed to be no solution."

Line eliminates stretcher leveling—Mr. Schneid continued that production time has been reduced on sheets of five grades as a result of being able to eliminate stretcher leveling and re-squaring procedures. Also, he said, the scrap loss on re-squaring has been eliminated as the sheets are cut clean and square on the McKay line. Net effect of the installation was a definite increase in overall departmental efficiency.

H. J. Verner, chief engineer, remarked that the McKay roller leveler could process these grades of stainless, within its capacity, to flatness approaching that obtained from the stretcher method. He reported that the Die Shear Line is being used to prepare for shipping cold rolled sheet from 4″ to 48″ in width, up to .050″ in thickness, and in lengths from 36″ and greater at normal production speeds. He particularly likes the McKaymatic* Die Shear Line for its ability to handle high finish stainless without edge or surface damage.

Available in many sizes—The McKaymatic* Die Shear Line is available in sizes to accommodate most commercial widths. Composed of decoiler (with coil car, if desired), roller leveler, measuring device, and cutoff press, it satisfies most requirements for sheet length accuracy and squareness, flatness, edge and surface quality protection and output rate.

For short runs or long, the McKaymatic* Die Shear Line will better any other line in economy and efficiency. Whatever your cut-to-length problem, McKay Machine's engineers have a solution. Write for literature; send your specific needs for a quotation to *McKay Machine Company, Youngstown 1, Ohio.*

*TM

LOOK TO

McKAY McK MACHINE

FOR PROGRESS IN METAL PROCESSING

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An axle has to be extra tough to take this kind of punishment. Low distortion induction heat treating makes it possible.

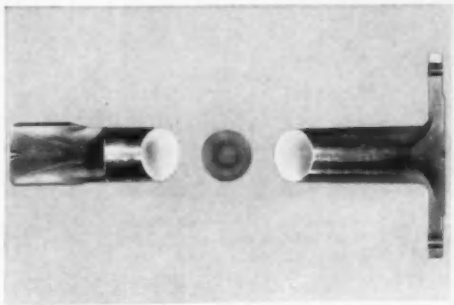
Why International Trucks shoulder bigger loads

Conventional heat treating just wasn't good enough for International Harvester's Fort Wayne Works. They wanted a process that would increase axle strength with minimum distortion. That's why they installed Westinghouse low distortion Induction Heating equipment at the Ft. Wayne truck plant.

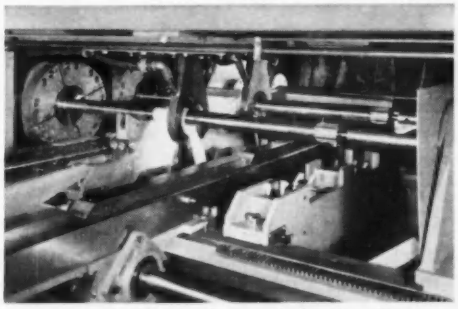
More than **150,000** IH truck axle shafts have been hardened with Westinghouse equipment, and none have required straightening!

Higher cost? Not with this new Westinghouse equipment. This method of induction hardening actually cuts costs . . . two ways. First, no cold straightening is required. Second, tests prove that axles made with 1041 carbon steel induction hardened with Westinghouse low distortion equipment are 100% stronger than axles made with higher-cost 4150 alloy hardened in a furnace. Westinghouse low distortion Induction Heating can bring you lower material and handling costs, fewer

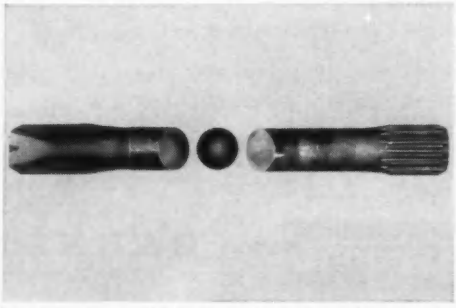




Westinghouse low distortion induction heating on a typical axle provided tensile strengths up to 290,000 psi using 1041 carbon steel. This compares with 185,000 psi using 4150 alloy and furnace heat treating.



The rugged Westinghouse Induction Scanner installs directly into the production line. No warm-up time required, no hot stock inventory. Equipment can be made to match your present and future production requirements.



Westinghouse induction heating offers more precise control of heated depth making it possible to replace a furnace treated alloy steel with a low carbon type.

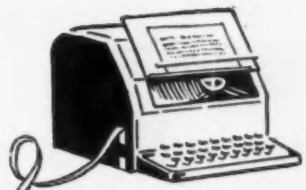
without Axle Failure

replacements, and more satisfied customers. For details, call or write your Westinghouse representative, or Westinghouse Electric Corporation, Industrial Electronics Department, Baltimore 3, Maryland. You can be sure . . . if it's Westinghouse.

Westinghouse

J-35016

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ON OUR WASHINGTON WIRE

Teamster boss James R. Hoffa's contract with 1500 Eastern truckers is likely to touch off some Washington investigations. Sen. John L. McClellan (D., Ark.) chairman of the Senate Investigations subcommittee, has asked his staff to "look into" the contract. Reports have it that the contract contains a clause aimed at flaunting prohibitions of the Landrum-Griffin Labor Reform Act against "hot cargo" and secondary boycott agreements.

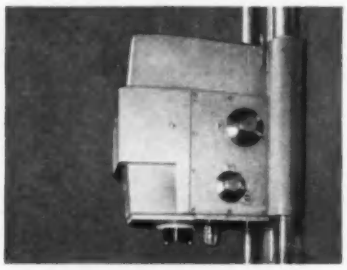
The Government is still promoting redesign of automobiles aimed at safety. The U. S. Public Health Service is distributing an article by the Roswell Park Memorial Institute which contends highway deaths could be halved by changing auto designs. Suggestions include a strong "bolt action" door lock and a sealed governor set at 70 mph; eliminating "hard top" styling to return to strong roof supports; redesigning truck rear structures to prevent compacts from running under them, and removing all pointed objects from interiors.

Businessmen's confidential reports to the Census Bureau could be used against them in antitrust prosecution cases by the government if the Federal Trade Commission has its way. The FTC is appealing to the Supreme Court for help to win the right to use information on secret census forms against firms which file reports. Census and Budget Bureau officials are fighting the move. Justice Dept. antitrust leaders are supporting the FTC.

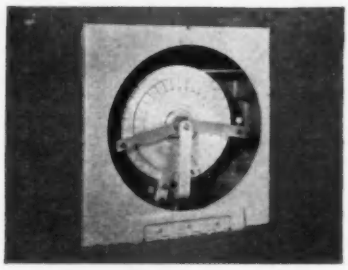
The Interstate Commerce Commission will hold hearings Oct. 18 to determine whether to permit virtually all the major railroads to increase freight rates. Shipping costs would be increased an average of one per cent. Among the rates to increase would be automobiles, $3 or $4 per freight car load; anthracite and bituminous coal, seven cents per net ton, and iron ore, three to five cents per gross ton.



NEW To control hone feed, simply adjust this dial on the set-up panel. Infinite adjustments are possible.



NEW Multiple speed control dial changes spindle speeds at a flick of the fingers.



NEW Reciprocation dial on Models 244 and 3010, and calibrated scale on Model 122, permit fast stroke control.

35 YEARS OF BARNESDRIL HONING EXPERIENCE

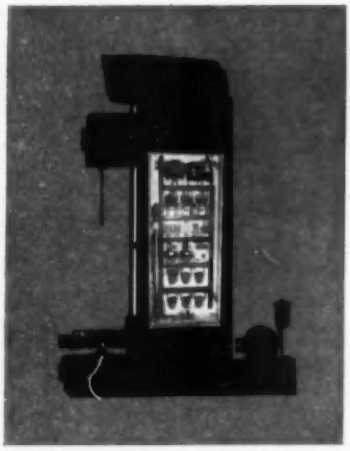
3 ARE WRAPPED UP IN THESE NEW HONING

Perhaps you saw them for the first time at the Machine Tool Show . . . a complete, new line of BarnesdriL high production honing machines. They're new from top to bottom . . . every feature exactingly engineered to cut costs and step-up production.

You'll find amazing new versatility . . . a broad range of capacities . . . greater ruggedness . . . more compact design . . . easier maintenance . . . new features galore! These BarnesdriL honers provide fast stock removal and precision control of bore size at high production rates.

We've incorporated 35 years of honing experience in them to give you machines that hone more economically than ever before.

If you'd like to know more, we'll be glad to send complete details. Of, if you prefer, a BarnesdriL sales engineer will call in person.



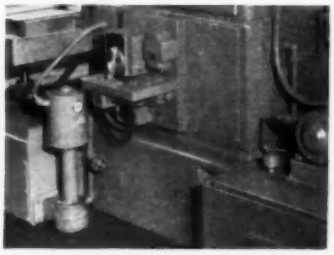
NEW Electrical controls are mounted inside the column of the machine to eliminate external panels.

BARNESDRIL HONING MACHINES

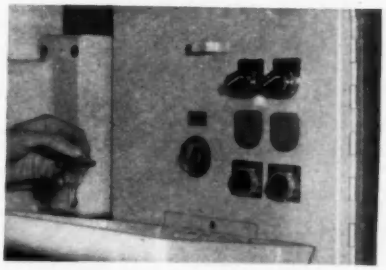
BARNES DRILL CO.
850 CHESTNUT STREET — ROCKFORD, ILLINOIS
DETROIT OFFICE—13121 PURITAN AVENUE



NEW Operating control panel placed at shoulder height away from splash of coolant.



NEW Coolant pump is in the open for easy maintenance. Coolant reservoir is part of machine base!



NEW Positive protection against tampering with set-up controls guarded by lock and key.

1

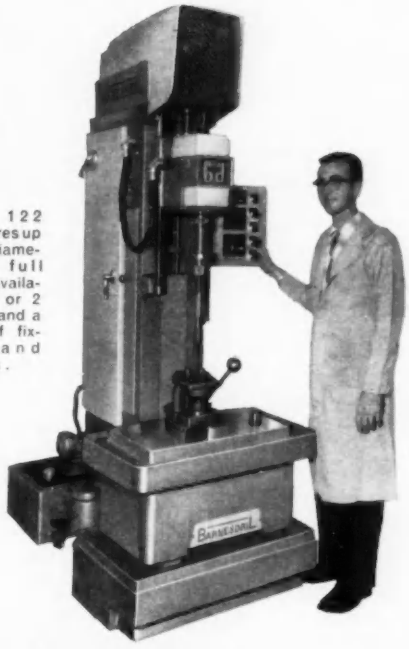
Model 244 hones bores up to 4" in diameter at full stroke. Choice of 3 stroke lengths, single or multiple spindles.

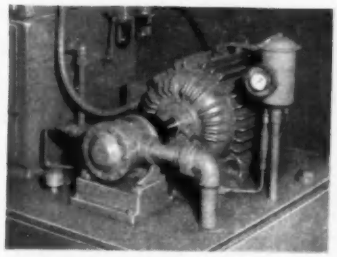


MACHINES

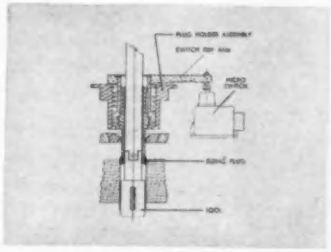
2

Model 122 hones bores up to 2" in diameter at full stroke. Available in 1 or 2 spindles and a variety of fixtures and tables.

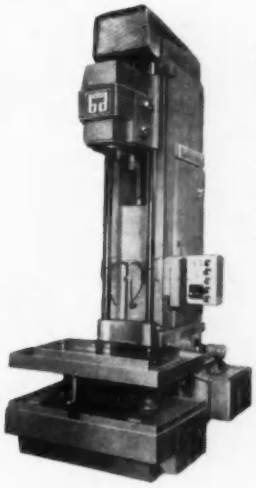




NEW Easy-to-reach hydraulic pump and controls instantly accessible for periodic checking and servicing.



Exclusive BarnesdriL Plugmatic bore-to-bore sizing maintains size consistency within .0002" on production runs!



3

Model 3010 hones up to 10" diameter at full stroke. Choice of 4 strokes. Adaptable for full automation.

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OFFICIAL UNITED STATES NAVY PHOTOGRAPH

This great seaborne health center will carry a new kind of aid abroad—*with your help.* Part of the people-to-people project Hope, it will enlist 200 specialists in sharing our health skills.



Ambassador with a blackboard, the Hope specialist will help the often woefully few local medical technicians train helpers. The result: many more hands. And that means one Hope dollar is multiplied many times over.

YOUR HELP CAN COME BACK A HUNDRED TIMES OVER



One local doctor for 100,000 people. These are the odds Hope may face. Yet Hope can mean so much. The health of this child. The health of five Indonesians. *Trained* hands and only a dollar's worth of penicillin can cure them of crippling yaws.

If enough of us help, the S.S. Hope will be outbound in 1960. First port of call: Indonesia. A bold health project called Hope will be underway.

The need is crucial. Many places, too many health hazards exist. Too many people robbed of the will to live. Too few hands to help. Often, a doctor for 100,000.

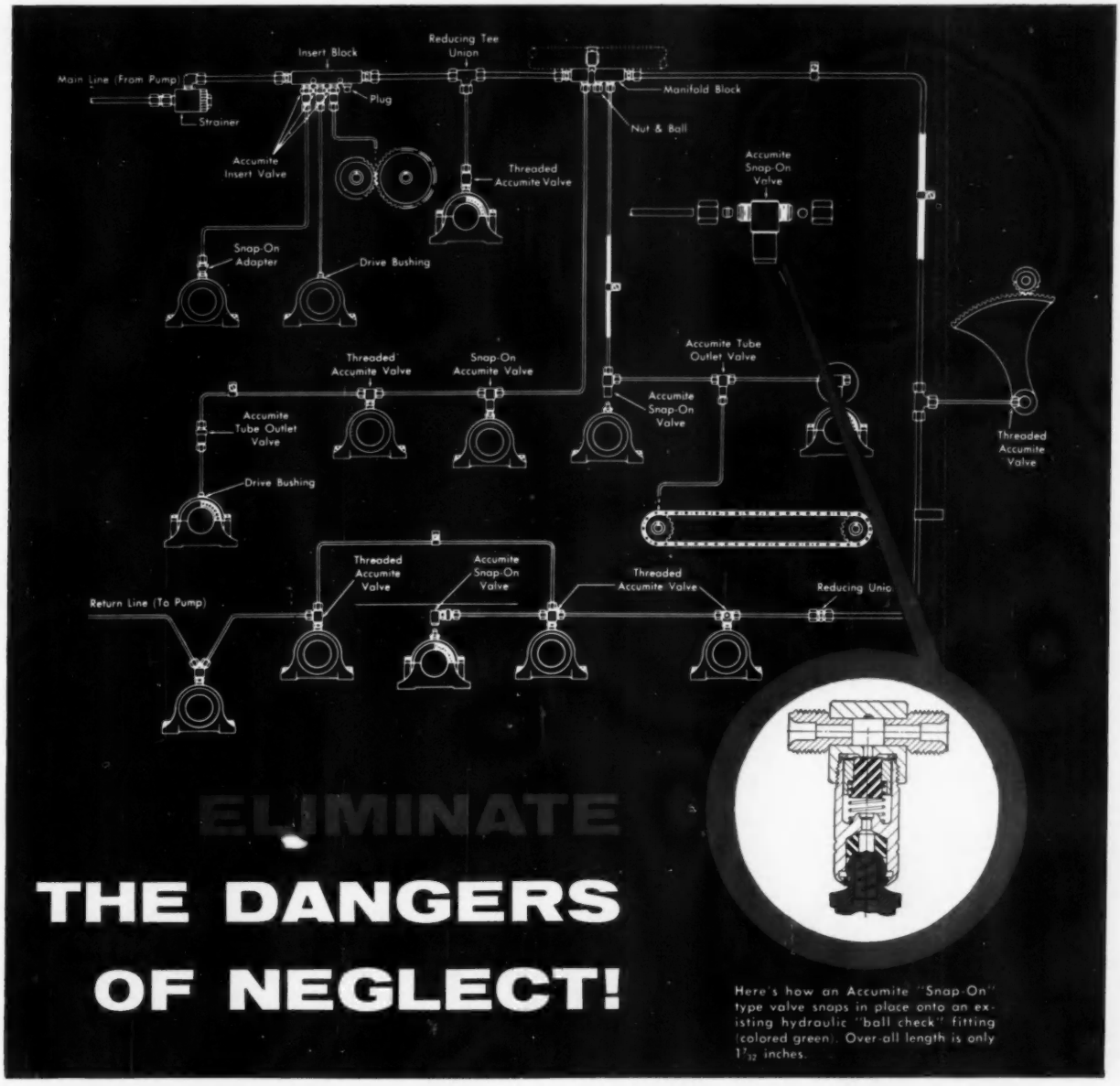
Hope's approach is *practical.* Help where a nation's doctors ask help. Help them help themselves to health. By training, upgrade skills—multiply hands. Hope's doctors, dentists, nurses, and technicians will man a center complete to 300-bed mobile unit and portable TV.

You can not only make every dollar do the work of many, you can earn a priceless dividend. With health comes self-respect. People at peace with themselves are less likely to war with others.

Hope is *yours* to give. It's a people-to-people project. For one year's worth, 3½ million Americans must give a dollar. Don't wait to be asked. Mail a dollar or more now to HOPE, Box 9808, Washington 15, D.C.

ADVERTISING COUNCIL PUBLIC SERVICE

HELP LAUNCH HOPE



Alemite Accumite® Centralized Lubrication System avoids costly breakdowns, work-stoppage. Automatic positive lubrication protects all machines!

The Alemite Accumite® Centralized Lubrication System comes complete with pump, metering valves and controls. Meters exact amount of lubricant to all bearings whenever system is operated by air, vacuum or manually at any predetermined frequency.

There's no need for a lubrication shutdown. No chance of work spoilage or bearing failure due to over lubrication. The Alemite Accumite System accurately meters .003, .006 or .009 cu. in. shots of oil or grease automatically. Is available with adjustable fittings for applications requiring measured metering from .003 cu. in. to zero. "Snap-On" and "Screw-In" type valves make for complete flexibility in converting existing systems to automatic operation.

You are assured economical, trouble-free operation of equipment. All bearings are sealed against dirt, grit and water. You are able to eliminate the dangers of neglect because all bearings receive proper lubricant in one, automatic, safe operation!

For complete details on Alemite Accumite® Centralized Lubrication Systems for large or small, stationary and mobile equipment (Canning and Labeling Machines • Tractor Trailers and Lift Trucks • Farm Implements • Machine Tools • Textile Machines • Any Machine or Vehicle with Moving Parts) write for your *FREE* Alemite Accumite Catalog . . . today!

Symbol of SW Excellence

ALEMITE DIVISION
STEWART-WARNER CORPORATION

1850 Diversey Parkway, Chicago, Illinois

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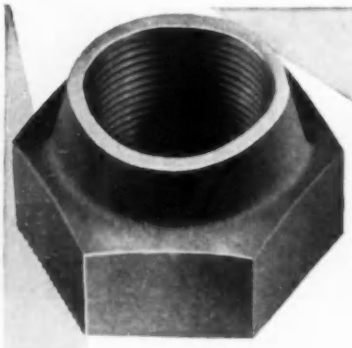
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New One-Piece
"Conelok"
with prevailing torque



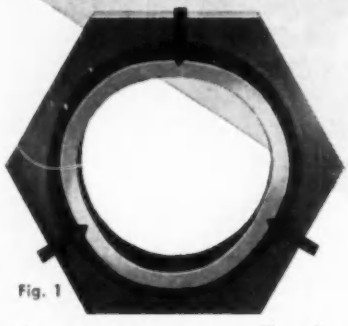


Fig. 1

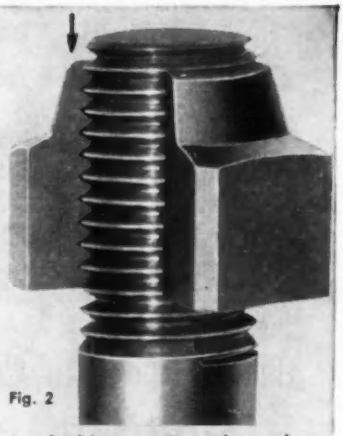


Fig. 2

Three sectors of the tapered portion of the CONELOK nut are preformed inwardly (Fig. 1). When the Nut is applied to a bolt, these conforming sectors are elastically returned to a circular configuration and create an inward and downward pressure which produces intimate contact between the load carrying flanks of the nut and bolt threads (Fig. 2). The shape of the cone sector displacement insures conformity with the mating bolt and maximum friction contact area. . . . The closed stress path in the locking portion of the nut and the advantageous distribution of locking pressure, produce a locking device of high fatigue life . . . and equivalent locking force is exerted at only a fraction of the stress of any slotted type locknut. CONELOK maintains its locking action through many re-applications. . . . It is adaptable to high, and low torque assemblies . . . to high torque stop-nut applications . . . and may be obtained in sizes from No. 10 through 1½", Full and Thick dimensions are "Standard". . .

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ASSISTANT EDITOR

Fastener Standards 1

Rapid identification of more than 160 standard aerospace fasteners — by configuration, specification number and generic name—is provided in a ten-page reference listing. The offering consists of an eight-page directory of 133 national aircraft standard, air force-navy aeronautical and military standard fasteners and related parts—plus a two-page insert of 34 SPS standards, such as recent high strength and high temperature bolt and locknut combinations. Fasteners are indexed numerically by part number in three separate groupings—for NAS, AN and MS parts, respectively. *Standard Pressed Steel Co.*

Chart for Extruders 2

A new chart which tells at a glance how to solve the problems which might arise in the extrusion of Cycolacr plastic, has been released. The chart covers items such as variations in dimensions, pulsations, lumps, rough surfaces or porosity, and sheet appearance. Alongside each are helpful recommendations. *Marbon Chemical Div., Borg-Warner Corp.*

Silicones 3

"Silicones Solve Space Age Problems" is the theme of a new eight-page reference describing a few of the many established applications for silicones in military and commercial aircraft, in missiles, and in ground support equipment. More than 25 applications are detailed and illustrated in this comprehensive brochure. These applications range through all types of air vehicles. *Dow Corning Corp.*

Threading Tools 4

An all new 44 page bulleting DT-60 describes and illustrates a complete line of threading tools. Covered are specifications, parts lists, ordering instructions and thread data. *Threading Tools Div., National Acme Co.*

Hydraulic Equipment 5

New condensed catalog EJS contains eight informative pages covering machine tool and industrial hydraulics including application recommendations. Illustrations, line drawings, charts and technical information is given. *John S. Barnes Corp.*

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Heater Brochure 6

A completely revised 48 page catalog, lists product and application data for Calrod tubular, finned tubular, cartride, strip, insertion, and vane heaters; forced and natural convection air heaters; and form G and edgewound over heaters. In addition, there are sections on heater control and wiring diagrams. Photos and dimensional drawings are shown for almost all types of heaters. *General Electric Co.*

Manifold Catalog 7

Industrial gas regulators and portable manifolds are described and illustrated in a 16-page catalog. This comprehensive catalog includes complete specifications and ordering information for regulators that are available for use with all industrial gases and completely portable manifolds for use with oxygen and acetylene. Inlet and outlet connections are listed according to the American Standards of the Compressed Gas Association. Recommended uses and installations are included in the description of each regulator. *Linde Co., Div. of Union Carbide Corp.*

Conveyors 8

An eight page bulletin describes small parts handling conveyors. Construction features of cleated belt conveyors for general, light and heavy duty, are explained and illustrated, with photographs showing both the product and its application in each instance. *Rapids-Standard Co., Inc.*

Carbide Catalog 9

A new 36-page price list number 960, gives specifications and new prices on a complete line of tungsten carbide tools, tool tips, dies, wear parts and Dex-A-Tools. The list was designed to make it easier for carbide users to find the prices of standard items. *Adamas Carbide Corp.*

Starter-Generator 10

A catalog file covering all standard and custom starters and starter generators is now available. The file includes a full line of 75 amp, 100, 200 and 400 amp starter generators as well as the direct cranking electric starters. Specifications, drawings and performance curves are shown in the catalog. *Breeze Corporations, Inc.*

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Equipment Rentals 11

A new two color, 16-page booklet outlines the advantages of renting materials handling equipment. A feature of the booklet is a one-page chart which enables equipment owners to itemize their operating expenses and compare them with the cost of renting comparable equipment. The comprehensive chart includes factors such as overhead, equipment obsolescence and other expenses often overlooked when determining cost of equipment ownership. *Clark Rental Corp.*

Weld Brochure 12

Advantages of mash seam welding as a high speed, high strength, low buildup method of coil joining are described in a new catalog. The illustrated six page publication, Welding News, volume 12—number 1, describes in detail engineering specifications and work range of 11 types of special and standard automatic coil joining welders, including mash seam, spot, arc and lap seam equipment, to meet every industrial requirement. *National Electric Welding Machine Co.*

Welding Data Book 13

A new edition of a pocket-size maintenance welding data book, including new application and design data, has been published. The 148-page illustrated publication is the seventh edition of the data book. In addition to providing a guide, indexed by application, to nearly 200 different Eutectic welding rods, electrodes, and chemical aids, the data book illustrates and explains general welding techniques and joint design hints. *Eutectic Welding Alloys Corp.*

Shears and Flangers 14

A new, 12 page bulletin covers a complete line of redesigned ring, circle, slitting shears and flangers. The bulletin fully describes and illustrates the complete line of power-operated shears and flangers for medium and heavy work with detailed features, specifications and accessories. Technical information governing the height of flanges for various gage materials is also provided. *Niagara Machine & Tool Works.*

Constr. Equipment 15

The summer, 1960 edition of Production Road, a quarterly magazine, has been issued. The feature article, entitled "The Big Mole," describes a tunnel digger that bores holes 29 ft in dia. In addition, a 4-page insert gives details about a new mechanical transmission-torque converter package. *Twin Disc Clutch Co.*

Adhesives Chart 16

A new adhesives properties chart contains the very latest information on epoxy adhesives, their application, cure times and physical properties. The reverse side of this chart contains such information as test methods, application suggestions and availability. Ready reference for adhesive and paste applications will take all the guesswork out of material selection. *Furane Plastics Inc.*

Tool Catalog 17

A newly revised 52-page catalog, describes a complete line of light-heavyweight machine tools and accessories. Complete specifications, catalog listings and descriptions of accessories for all tools are included in the bright, two-color catalog. Photos and drawings supplement the text. *Rockwell Mfg. Co., Walker-Turner Div.*

Drive Selection 18

Bulletin 21103, "5 simple Steps to the Selection of Timing Belt Drives," gives a method involving a minimum of mathematics for the selection of a drive to fit any application. The bulletin includes five sets of curves for drive-width selection, was developed to eliminate tedious computation. A standard timing belt catalog is the only outside reference needed. *T. B. Wood's Sons Co.*

Powder Metallurgy 19

The latest powder metallurgy quarterly, a publication of the Metal Powder Industries Federation, and the American Powder Metallurgy Institute, has just been released. It features case histories of electrical applications of powder metallurgy parts, showing that the products of this process are being used in an ever-increasing quantity and variety of applications. *Metal Powder Industries Federation.*

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Finishing Machines 20

A four page, illustrated catalog describes a complete line of flat surface grinding and polishing machines for finishing and deburring parts. A complete list of specifications for each machine is included in a handy chart form. Six other types of abrasive belt finishing machines are also illustrated and described. *Acme Mfg. Co.*

Vacuum Melted Steels 21

A new technical data book on the consumable electrode method of vacuum melting super alloy steels has just been released. This book has been written to supply metallurgists, design engineers and research and development men with the latest factual data on vacuum melting, the advantages of metals produced by this method and the properties of alloys made by the Midvac Process. *Midvale-Heppenstall Co.*

Press Brakes 22

A new 24-page condensed catalog describes mechanical and hydraulic presses and press brakes, hydraulic shears, press and press brake tooling, and special machinery. The generously illustrated catalog also presents basic specifications for the most commonly used presses and press brakes. *Verson Allsteel Press Co.*

Fact Folder 23

An up-to-date, 4 page brochure, designated 9572, describes the electrical, physical, mechanical, and chemical properties of Rulon and Teflon. Especially helpful to design engineers, the brochure gives a comprehensive comparison of the properties of Rulon and Teflon . . . and shows typical applications of these materials. *Dixon Corporation, Plastics Div.*

Valve Catalog 24

This catalog, number 800-A, contains competitive cross reference charts and weight tables for comparative purposes, and data covering a variety of pressure controls, temperature controls, solenoid valves and strainers. *Detroit Controls Div., American Radiator & Standard Sanitary Corp.*

Synchro Mounting 25

This new leaflet, which will be invaluable to every synchro user, gives comprehensive details and illustrations on mounting and zeroing all types of synchros and servomotors, fixing gears or pinions. Tables give easy to read details on mounting panel drilling and recommend fixing screw sizes. A comprehensive parts list is also given from which the ordering reference for any of the accessories may be obtained. *Muirhead & Co. Ltd.*

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